

The second time around there ought to be a law...¹

By Frank Frisbie, P.E. and Suzette Matthews, Esq.

The second time you walk through the river neither you nor the river are the same². This advice calls out from history, to those who seek to chart the future course of NAS architecture. In that context the authors suggest that a dimension of ATM planning that has consistently thwarted the forecasters and designers is the lack of concurrent user implementation. ATM design that assumes/depends upon broad (even universal) voluntary user compliance to deliver promised results is folly. At best there is a gulf between the early adopters who seek immediate benefits and the skeptics or those satisfied with the status quo. But the passage of time has changed both the river and those crossing to the extent that a balanced approach whereby airborne and ground deployment are firmly linked is needed. Put another way, the investors in the infrastructure (Congress, taxpayers, AMT ...) need to face up to the reality that "hoping" for a reciprocal investment from the users (aircraft operators) is NOT a rational basis on which to proceed.

Accepting the cited, hard-earned equipage lesson should not be an excuse to abandon development (and implementation) of a forward looking NAS architecture but the main reason to stimulate a different, better result. The answer we offer is to find a mechanism that will enable the FAA (the ANSP) to achieve symmetrical avionics compliance.

There are numerous options to consider in accomplishing universal, or at least targeted equipage, each more or less difficult to accomplish depending on the costs, political, and yes, competitive factors. The following are illustrative of those options:

- "Win-Win". Equipage delivers cost efficiencies and operating benefits to the operator that outweigh cost of equipping. So operators equip voluntarily regardless of any incentives from the ATC system. This is the equipage Holy Grail. But it's also an engineering Rubik's Cube. And what happens when insufficient capitalization, weak cash flow, or sources of credit inhibit an operator--especially a small businesses or new entrant--

¹ This paper first appeared in the Spring 2020 issue of the Air Traffic Control Association, Inc.'s *Journal of Air Traffic Control*. See www.atca.org/journal

² Paraphrase of Heraclitus "On the Universe"

from equipping, even when it makes financial sense? Should the government loan the money to equip struggling or marginal operators, even if they are bad credit risks, or alternatively buy the equipment and lease it to them on a remunerative basis, to achieve ATC systemic benefits?

- *"Taxpayers First"*. Mandate equipage--without subsidies--based on the rationale that overall financial benefits to the ATC system outweigh the total cost of everyone equipping. This is the most rational approach from the point of view of benefiting taxpayers and passengers/shippers, who after all, ultimately pay for the system. On the other hand, this approach is the most problematic politically, requiring rulemaking and possibly legislation—and you know how that goes....
- *"Buy Cooperation"*. If universal equipage would realize benefits for the ATC system that outweigh the cost, but equipage isn't cost beneficial for individual operators, it might make sense for the government to mandate equipage, and subsidize operator purchases or have the government buy and supply the equipment. As the equipment buyer, the government might realize the benefit of volume purchases, and could more easily monitor and maintain quality control.
- *"Front of the Line"*. Those who equip on their own dime might be afforded operational incentives, for example they are first in line for access to congested airspace or limited airport services. Again however, as a matter of public policy some accommodation might be appropriate for small businesses or new entrants, to level the financial playing field with larger or legacy operators. This approach however is basically voluntary. If the goal is universal equipage, good luck.
- *"Back of the Line" or "Foreclosed"*. Those who don't equip on their own dime might have to line up for service behind those who are equipped, or might be foreclosed entirely from airspace or other service for which they are not equipped. There is long standing precedent for this approach on safety grounds, for example the Mode S rule. As in the case of "first in line," some accommodation might be appropriate on policy grounds to prevent disadvantaging small businesses and new entrants. Again however, this is a voluntary approach that will not necessarily result in universal equipage.
- *"Contingent Subsidies."* Using this approach, the operator would agree to buy and equip on the condition that FAA upholds its end of the bargain by delivering the interfacing—and presumably operationally beneficial--

NextGen system by a date certain. If FAA fails to deliver the implemented capability by the agreed upon specified date, the government must reimburse the operator the cost of the equipage. This concept resonates with fairness, and is a powerful incentive for FAA not to overpromise, and to deliver without excuse. The authors suggest that such FAA-carrier agreements may be within the scope of FAA's "other transactions" authority (OTA) This mechanism could be combined with a mandate to achieve universal equipage—a powerful incentive for FAA to deliver NextGen capabilities on time!

As indicated earlier the authors have developed deep skepticism in a plan for ATC/ATM modernization whereby the infrastructure provider (i.e. ANSP) promises to deploy an enhanced end state architecture with the expectation that its attractiveness will lure users (beneficiaries) to complementary equipage. It seems in that construct both sides are prone to disappoint.³ It is also clear that the Executive Branch (FAA/DOT/OMB) has very low confidence that a plan that simply mandates user equipage will gain Congressional approval.

While each reader brings a bias and experience to bear in declaring a preference for one or another of the aforementioned plans, the authors counsel more rigor rather than less if a successful outcome is to result. This leads us to advocate that no joint infrastructure/avionics project be allowed to progress beyond the planning stage into any stage of funded deployment until there is in place a binding regulatory or contractual action assuring synchronous equipage. And specifically in situations where *universal equipage* is required in order to realize the benefits of a NAS upgrade, the authors further recommend an equipage plan that combines the "Buy Cooperation" and "Contingent Subsidy" options described above, as follows:

- First, establish *date certain* mandates for equipage by law or regulation, pegged to *date certain* ATC/ATM infrastructure deployments
- Next, under the Buy Cooperation option, subsidize new entrants and small or disadvantaged operators (by loan or outright payment), or give them the equipment, but only to the extent they can demonstrate that they

³ Recent findings of the DoT Inspector General bear out the authors' conclusions on this score. See "NextGen Equipage: ADS-B Out Equipage Rates are Increasing, but FAA Must Address Airspace Access Issues," Report Number AV2020014 (December 19, 2019), <https://www.oig.dot.gov/library-item/37626>

cannot meet the equipage requirements without devastating financial or competitive hardship

- Finally, provide all other operators a “Contingent Subsidy” contract, that is, require them to equip on their own dime, *by date certain*, without a subsidy, but with the assurance that if FAA fails to meet its *date certain* deployment date, they will be made whole and reimbursed by subsidy for equipment purchased and installed. This is necessary to make sure that the FAA (ANSP) side of the partnership lives up to its commitments.

Whatever the path forward, we know that doing it the old way doesn't work. Notwithstanding the heavy lifting on the front end, synchronizing operator equipage with air traffic modernization will increase the chances for success of the entire effort. The payoff will be more than justified. Sonext time there ought to be a law.
