

## Airline/User Centric Airport Flow Optimization versus ATC Centric Flow Manager Program (TBO)

### Airline/User Centric Airport Flow Optimization

1. Airline/user has business control over their aircraft movement and arrival flow (schedule, gates, crew, etc.)
2. Easily scalable for every flight, every day, at every airport, 24/7-365, worldwide.
3. Airline Centric Flow Manger is deterministic based on the airline's business needs without the need to worry about ATC, sector and sovereign boundaries
4. Airline Centric Flow Manger works to prevent delays from happening in the first place (Defect Prevention)
5. Easily manages every flight at every airport 24/7-365, starting within months, all day, every day, starting "*day of*" hours prior to landing
6. Immediately reduces random point overloads, which is the root cause of delays, congestion and excess CO2
7. Low risk, fully developed, operational, tested and validated software (FAA Task J and Embry-Riddle University, 2010-2012, GE Aviation 2013, Georgia Tech, 2006, etc.), COTS solution available starting within months
8. Transparently crosses FIR and ATC sector boundaries
9. Capable of reducing ATC structure
10. Reduces controller workload with pilot managed Required Time of Arrival (RTA) flow time for each aircraft, leaving separation to the controller
11. One pilot manages one aircraft to destination
12. Utilizes onboard navigation and communication capability bought and paid for, and already in place on the aircraft
13. Airline Centric Flow Manger is a fully coordinated, real time, "*day of*" automatic data arrival flow process between users (airlines/operators), ATC and aircraft
14. Highly flexible aircraft movement environment, easy to scale up worldwide
15. Provides all ATC/airlines/operators aircraft specific information on what every IFR aircraft wants to do in the future (airline, GA, etc.)
16. Low cost for users/ATC, with immediate proven, cash benefits
17. [Reduces airspace complexity](#)
18. Shovel ready, \$100 million, 3-year project to cover the entire US
19. An Airline Centric Flow Manger process has been [fully operationally tested and validated by FAA, Embry-Riddle, GE Aviation and others](#)
20. RTA capable Flight Management System (FMS) already installed in the aircraft, allowing pilots to enter a time over a navigational fix, and the airplane automatically adjusts speed to meet that time

### ATC Centric TBO Program

1. ATC maintains control over the movement of the user's aircraft, with zero business/user input into arrival flow
2. Limited scalability to just a few larger airports when congested and internal to each sovereign airspace.
3. TBFM delay is subjective/random as each ATC center assigns each sector's delay to meet the assigned TBFM boundary time
4. TBFM does not eliminate or prevent delay, but targets more efficient delay (Defect Correction)
5. Only manages limited flights, at 20 airports during part of the day based on traffic (e.g., ATL 6 AM-10PM) with limited reach from arrival airport
6. Low impact on random point overloads, reportedly creates adjacent sector overloads and related delays
7. High risk, yet to be fully developed, computationally complex software, after ANSPs already have spent \$100s Billions and decades with little impact on delays/congestion (MLS, AAS, CPDLC, GPS, FANS, RNP, ADS-B/C, NextGen, Sesar, etc.)
8. Difficult/impossible to cross FIR/sovereign boundaries
9. Perpetuates or even increases ATC structure
10. Increases controller workload, as controller must separate aircraft, receive time communication for each aircraft, manage flow time/speed for many aircraft
11. 10s of controllers manages one aircraft to destination
12. Full implementation requires new processes and equipage (navigation, communication, etc.) at unknown added cost
13. TBFM has limited, if any, real time automatic coordination between users, ATC and aircraft with, again, zero user business preference inputs
14. Controlled aircraft movement environment, difficult to scale up, notably across national boundaries
15. Limited to no information available to other ATC/users on what other IFR aircraft are doing, or, more importantly, want to do
16. Very high cost for ATC, with limited (none proven) benefits
17. Adds to airspace complexity
18. Multi-Billion dollar, decades long project to cover the entire US, maybe
19. FAA will institutionalize TBFM such that any hope of airlines/operators recapturing control over the movement of their aircraft or reduction of the structure around the airports will be lost for decades.