Did you know...?
Poor weather conditions may lead to airspace closures and significant financial losses due to flight delays.

Objective:
To explore the application of Collaborative Decision Making (CDM) in routine flights.

Approach
- CDM represents the sharing of information between an Airline Operational Control Center of each airline and the aviation authority to improve the conditions of national airspace.
- The FAA then processes this information and decides, from all the recommendations, which flight path each airliner should take.
- En-Route Resource Allocation Prototype (ERAP) software is recommended as the tool of choice for this purpose.
- ERAP will allocate resources to flights through assigning delays and rerouting aircrafts. It does so through user-defined priority that can be changed as required by ATCs or FAA.

Results and Discussion
Three models were compared to each other in the simulation to test which incurred the least delay.

1. Mathematical Model, represents a flight plan without the use of CDM and route planning.
2. Alternative Routing Model, simulates the usage of CDM where airspace users and the ATC make a concerted effort to plan the route of an aircraft through congested airspace.
3. Dual Origin-Destination model, explores the application of the CDM framework in a more complex case with 2 Origin-Destination pairs to better reflect a real world situation.

In all cases, CDM reflected an overall positive effect on the efficiency of the airline.

Conclusion:
Using the base model from Bertsimas and Sarah Stock Patterson, it was demonstrated that the concept and application of CDM in alternate routing could potentially increase the efficiency and net benefit for airlines.