

## Objective Function

Minimize transport energy  
per passenger-kilometer

## Variables

### Aircraft Design

- Wing, fuselage, and tail OML geometry
- Fuel tank sizing
- Engine sizing
- Sizing of primary structure
- Weights of dozens of secondary components
- **Initialized to B777-300ER**

### Mission Design

- Cruise Mach, altitude,  $C_L$ 
  - Step climb

## Constraints & Models

### Requirements

- Payload and range
- Previously-stated reqs.
- Various FAR 25 regulations

### Key Models

- **Aero:** DATCOM-like buildup
- **Propulsion:** GE9X w/ physics-based scaling
- **Structures:** Empirical where possible, physics-based for LH2 systems

### LH2 major weight changes:

Fuel ↓ ↓

Fuel tanks ↑

Fuselage ↑

Wing ↑

Loss of  
spanloading  
efficiency

