Why Fly

Flight is “innately” cheaper, safer, faster, and more enjoyable than surface travel.

Flight is cheaper

Birds travel an order of magnitude faster than their earthbound brethren with equal mass and metabolic rate and therefore use 1/10 the energy to transport a given mass a given distance (“A sparrow, which is identical in mass and metabolic rate to a mouse, flies an order of magnitude faster than a mouse runs, and so has a minimum cost of transport an order of magnitude lower than that of a mouse” Proceedings of the National Academy of Sciences USA, Volume 95, pages 5448-5455, May 1998 Engineering). And sparrows are on the low efficiency end for birds, with soarers like the albatross at the top.

Birds are also able to travel more directly between two points and to exploit favorable air motions. There are many instances where surface vehicles have to travel great distances to access a nearby region because of water or mountains. The San Francisco Bay Area is a typical example where hours can be spent in traffic to access a region a few miles distant. Surface travel in these circumstances can be hundreds of times costlier and more time consuming than flight.

Maintaining a flight infrastructure is much less costly and disruptive than maintaining a system of roads, rails, and streams. Flight transport can reduce road traffic and has no road, rail, or stream width limitations. Surface (2D) transportation requires an enormous amount of time and resources for construction and operation.

Everyone on Earth is connected by air, flight joins people separated by mountains, oceans, and hostile intermediaries. Flight can greatly reduce the resources needed for transportation.

Why should aircraft cost more than cars? Flight vehicles can have much more even structural loading. Automobiles have four small contact patches and must be strong enough to suffer indignities like hitting a pothole while braking. Roadable aircraft have been poor cars. Aircraft can be lighter than cars per person or per unit payload, Consider the vehicle mass per person in planes, cars, trains, and ships.

Flight is Safer

Flight allows for greater distance from surface obstacles and between vehicles. Roads represent a small portion (~1%) of the Earth’s surface and are restricted to the surface. Flight vehicles can cover 100% of the Earth’s surface and access a large number of flight levels via 3D rather than 2D travel. The distance between vehicles can be much greater via increased surface coverage, additional flight levels, straighter paths, and shorter trips. Flight vehicles can travel at steady and predictable speeds and air transport is more automatable. Reduced blocking from surface obstructions aids cameras, RADAR, LIDAR, SONAR, vehicle to vehicle, vehicle to ground, and vehicle to satellite communication. We also have much more experience with automated flight.

The safety of legacy flight vehicles is compromised by the need to take off and land at high speed, the proximity of other vehicles at the takeoff and landing sites, the need to maintain a certain speed to be airborne, and the lack of passive safety features.

Flight vehicles with thrust greater than mass can provide increased utility, including the ability to stop in midair, change direction rapidly to prevent collisions, easily refuel inflight, and takeoff and land in dense urban environments.

Flight vehicles also can be designed to have stable high drag descent and controlled structural deformability, making collisions, and forced landings less dangerous. Ballistic parachutes can provide additional safety.

Multiple technological advancements have increased our ability to develop low cost, robust, integrated control, communication, and navigation systems that can provide greatly increased travel safety and convenience while reducing resource expenditure.

Flight is Faster

Flight paths are more direct and do not suffer the speed limitations associated with surface obstructions encountered by road, rail, and water vehicles.

Flight offers time saving for people and critical cargoes and capital cost can be reduced by more frequent flights.

Flight is More Enjoyable

Earth from above is more beautiful, our view of it is much greater and it yields a better understanding of our environment. Flight is typically smoother as it does not require the stopping and starting associated with surface travel and it allows much greater freedom of movement via the third dimension.

Epilogue

This is the time in our history for the transition to flight. We need to reduce the cost and planform area for personal vehicles capable of vertical takeoff and landing (VTOL).

Mass market personal air travel requires reductions in cost and increases in safety and power density. Entry level 2 place helicopters (Robinson R22) start at ~$300,000.00, 20X the cost of a car and require large rotor swept areas (46m^2). Power per unit plan area needs to be increased ~10X for compact VTOL vehicles. Helicopters also require skilled operators.

Progress in computers, artificial intelligence, radio communication, GPS, cameras, LIDAR, RADAR, SONAR, and inertial sensors, have the potential to greatly increase safety and efficiency, while reducing necessary operator skills.

Much of the area of a city is taken away by roads and parking regions. Personal aerial vehicles do not require roads and can park from above, thereby reducing parking space access roadways. They can park on roofs to greatly reduce the need for a retailer/homeowner/+, to have a parking region. They also increase security and allow our cities to be walkable, bikeable, and livable. All of a sudden, a lot more

room is available in cities. Apartments, cafes, markets, parks, amphitheaters, + seem a better choice than parking lots. Upward mobility is the future.

Ford felt the automobile could free people from the vagaries of the mass transit system. We now need to be freed from the vagaries of the automobile. The wheeled cart has been very useful but it's time to rise above it.