Trains are the greenest form of transportation!

	Rail	Road	Aviation
Mobility/ Flexibility	Railway transport is extremely flexible in terms of capacity. Trains can add or remove cars with minimal impact on operating costs, even while trains are in motion (Denmark). Cars in trains can be separated while underway and go off to different destinations. Unlike aviation, rail traffic can easily serve intermediate points without adding significant costs or requiring significant delay or additional terrestrial space. Rail enjoys a dedicated ROW (right of way), bypassing traffic congestion. Although our railways in the U.S. are also experiencing some congestion, this problem could be overcome with more public investment in rail infrastructure.	Roadways are often perceived as being very "mobile" and "flexible." The reality is quite different. Because roadways are extremely inefficient in terms of land use, they become congested at the very times when most people wish to travel, and traffic becomes stalled, causing mobility to plummet.	The primary advantage of aviation is speed over long distances.
Environmental Electricity is the preferred power source for transport.*	Rail is inherently well suited for propulsion using electrical power. Where direct electrical power is not available, rail transport has depended on very efficient hybrid motive power, for many decades. Railways run upon a permeable surface, reducing problems relating to soil erosion from precipitation.	Paved roads are an impermeable surface, resulting in concentrated run-off and soil erosion, causing water and land pollution. All motor vehicles contain large amounts of steel, rubber, glass and plastic, and use up large amounts of fossil fuel in their manufacture. From a per-passenger viewpoint, private cars therefore have a very high cost, compared to vehicles that carry large numbers of passengers.	Requires large areas of pavement for storage (parking) and runways: all impermeable surfaces. Fossil fuel-powered aircraft pollute the air and contribute to global warming just as other modes do (see carbon footprint data below).

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Safety	The safety record of rail in the US has in recent years fallen below that of aviation. Other nations, however, have clearly demonstrated that with proper investment and maintenance, rail transport can be virtually accident-free. Trains are also an unattractive target for terrorists, because they are loosely populated. Security measures for rail need to focus on the tracks, not the train; derailment would be the way a terrorist would target rail transport.	Road transport has the worst record by far of all transport modes despite the huge taxpayer investments in roadway safety. More people have died in traffic crashes than in all the wars the U.S. has fought, since its beginning as a nation.	Aviation currently has the best safety record in the United States, but that is primarily because of a huge investment of federal funds to improve safety.
Energy	A flanged steel wheel rolling on a level steel rail is the most efficient means of transport over most corridors.	A rubber tire rolling on pavement requires **ten times more energy** to overcome rolling friction than a steel wheel rolling on a steel rail. This is a fundamental principle of physics that cannot be "engineered out" of the equation. The primary advantage of rubber tires comes into play when grades are very steep or the terrain is not well prepared and maintained.	
Health	Public transit offers the option—even if not all passengers take advantage of it—of other means of travel to access it: walking or bicycling.	The private car, no matter how low-emission it may be, contributes significantly to a sedentary lifestyle, with serious health effects.	In the U.S., most passengers travel to airports in private cars, although more public-transit options are being offered in some cities.
Cost		Private car: 53.5¢ / mile. The average U.S. family spends about $500/month on each car they own.	
Carbon Footprint	0.42 lbs. of carbon ppm for U.S. rail; 0.22 for European rail	Private car: 0.79 - 0.97 lbs. of carbon ppm, not including secondary effects. Long-distance bus: 0.18 lbs. of carbon ppm	1.28 lbs. of carbon ppm, including secondary effects
Weather	Rail has a very significant advantage during most adverse weather conditions.	Road traffic is even more dangerous in inclement weather than it is in good weather.	Air traffic, while it may operate well in adverse weather, may not be able to take off or land under such conditions.

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Land use	Except for vertical takeoff aircraft, rail is the most efficient form of transportation in terms of land use.	Road traffic is efficient in terms of land use only at relatively slow speeds (25-40 mph) because of the clearances required between transport vehicles. Space requirements can be reduced through computer-assisted control systems, but this factor is not sufficient to make them competitive with rail transport in this category. And, not only are the ROW requirements for road transport extremely high compared to rail, but the main disadvantage of road traffic is the need for parking space for individualized transport. In most metropolitan areas, parking comprises the largest single land use: there are 8-10 parking spaces for every registered vehicle. This is a huge amount of land dedicated to unproductive vehicle storage. Yet, in spite of this huge amount of land devoted to vehicle storage, people still often complain about "inadequate parking."	Fixed wing aircraft require extensive land area, all of which is publicly owned and therefore exempt from property taxes. Commercial airports also offer large parking areas for private cars, using up even more land.
Comfort	Persons traveling in long-distance trains are able to work, play, sleep, eat and take care of basic needs while in transport. Time traveling is not wasted, but can be spent accomplishing other tasks. The experience of rail travel offers scenery at "see level."	When operating a motor vehicle, primary focus must be given to vehicle operation. It is generally not possible to use this time for other pursuits or needs. And listening to music, the radio, or audio books is a distraction—another safety concern. Computer-operated vehicles may change this somewhat, but the technology has NOT proven to be as reliable as its proponents suggest.	Aviation has become much more cramped and uncomfortable as the industry strives to become more efficient. Concerns about the threat of terrorism, and the susceptibility of aviation to incidents of terrorism has made boarding aircraft much more unpleasant and time-consuming.

* Liquid fuels are inherently inefficient and wasteful when converted to energy for motion. Using electrical energy for propulsion minimizes energy loss when converting electrical energy to motion. Electrical propulsion allows dynamic braking, thus returning energy to the grid when slowing or stopping.