Travel Facts and Our Advice.

NB We have yet to investigate:- sleeping car trains, ships and boats, and LPG vehicles. It will be done.

Every one knows that travelling is one of the major consumers of fossil fuels. Yet accurate information about the relative efficiencies of different forms of travel is hard to come by, and the information is in any case confusing because often information is presented with bias. Here we attempt to dispel some of this confusion.

In today's world travelling can be undertaken by:-

a) Human power – walking, cycling, rowing, etc.
b) Wind power – sailing, balloons, land yachts.
c) Road transport.
d) Trains.
e) Aeroplanes
f) Helicopters
g) Power boats and Ships.

In terms of global warming walking and cycling have a negligible effect on the production of CO_2 and it is widely recognised that they should be used as much as possible. Rowing and sailing account for a very small proportion of travelling. They can be quite efficient (particularly for simple wooden boats) – though boats can involve lots of embodied energy, complex equipment and need constant maintenance and re-fitting which undermines their environmental efficiency.

Helicopters are very inefficient in terms of fuel consumption per passenger mile, but fortunately form only a very small part of the transportation load.

However the crucial types of transportation as far as increasing greenhouse gases the environment is concerned are road, rail, aircraft and shipping. These are the areas which we focus upon.

Travel Relative Efficiencies.

We give the conclusions here for the benefit of readers who do not wish to wade through the analysis, which is available in "Travel Analysis".

Travel and transportation are rightly recognised as being major contributors to the global warming crisis. In terms of their contribution to the problem of global warming different forms of travel have very different levels of efficiency.

Occupancy.

Obviously the number or % of seats filled makes a huge difference to the efficiency of a particular form of transport. We give relative efficiencies for various levels of occupancy.

For private cars the situation is straight-forward and we indicate the effect of having cars partly filled, because this is their normal state and is under the control of the owner/driver.

Public transport vehicles are not usually filled to capacity but the occupancy is very variable, (sometimes in excess of seating capacity). Inter-city trains, long distance and private hire coaches, charter aircraft, are usually filled to a high level of capacity (perhaps as high as 80%). Buses and Commuter trains are the most variable – they are often filled or over-filled during the rush hours but are much more empty at other times. However for most public transport the service will run, however many people are on board. This means that

adding an individual passenger adds very little indeed to the CO_2 output of the service (possibly extra stopping and starting and a relatively small increase in vehicle weight). Eventually of course adding more passengers may lead to a new service, which will involve a step rise in the CO_2 output.

We give efficiencies for full vehicles and for half full vehicles.

Travel Efficiencies.

The efficiency (or lesser inefficiency) of the different forms of transport are given below. The list reads from the most efficient to the least and the number is the appropriate factor. Raw figures take account of fuel usage for travel. Adjusted figures are a preliminary attempt to take account of the CO_2 emissions caused by building and maintaining the vehicles.

In this new version we give the figures in terms of equivalent miles per gallon (of oil fuel consumed at ground) level per person travelling. This is a measure which will be familiar to most people. The "Adjusted CO_2" figure is in equivalent kgs of CO_2 per 100 miles.

Note. Aircraft emissions have a much greater global warming effect than the same emission at ground level this is factored into the figures.

Mode of Travel	Occupancy	Raw mpg	Adj mpg	Adj CO2
Light-rail/Trams	full	850	800	1.5
Commuter Trains	full	600	570	2.1
Coaches	full	520	490	2.4
Light-rail/Trams	50%	425	400	3.0
Mini-bus	full	410	390	3.1
Small Buses	full	400	380	3.1
Commuter Trains	50%	300	285	4.2
Inter-city train	full	300	280	4.3
Coaches	50%	260	245	4.9
Mini-bus	50%	205	195	6.1
High Speed Train	full	200	190	6.3
Inter-city train	50%	150	140	8.5
Medium family diesel car	Drv+3	192	130	9.2
Medium Family petrol car	Drv +3	160	105	11.3
Medium family diesel car	Drv+2	144	100	11.9
High Speed Train	50%	100	95	12.5
Medium family diesel car	Drv+1	96	67	18
Medium Family petrol car	Drv+1	80	56	21
Medium family diesel car	Drv +0	48	34	35
Medium Family petrol car	Drv+0	40	28	43
2 seat grand touring car	Drv+1	36	25	48
Flight 2000 mls	75%	23	20	60
Short-haul flight 830+ mls	62%	22	18	66
Jumbo flight 3000+ mls	75%	18.5	17	70
Small helicopter	Full	20	16	74
Short-haul flight 300 mls	62%	16	14.5	82
Large helicopter	Full	18	14	80
Short-haul flight 110 mls	62%	14.5	13	92

2 seat grand tourer	Drv+0	18	13	92
Small helicopter	50%	10	8	150
Large helicopter	50%	9	7	170

Comment on Above.

It can be seen that going 1000 miles on a full light rail system is about 30 times less damaging than doing the same distance in a medium sized petrol family car occupied only by the driver or about 50 times less damaging than covering the same distance in a short-haul flight. As for Jeremy Clarkson in a Ferrari well!

Travel Targets.

If we are to get our CO_2 footprint down to about 2.5 tons per person it is probable that we cannot "afford" more than about 0.75 tons of CO_2 on travel per year. This allowance would enable us to travel about 62,000 miles on a full tram, 35,000 miles on a full coach, but only about 2,000 miles if all our travel was done by aircraft or as the single occupant of a family car. In practice this allowance would be spread over a mix of transport types.

A mix that could meet this figure might be:-

2,000 miles on a tram.
2,500 miles on an inter-city train – or 3,500 miles on a coach.
1,000 miles on a short-haul flight – or 3,000 miles every 2 years, long-haul.
1,000 miles as driver only of a family car.
500 miles as driver and 1 passenger in family car.
500 miles as driver and 2 passengers in a family car.

Our Advice concerning Travel.

This is mostly pretty standard, but our analysis and the consequent table above do lead to some conclusions which are not so widely recognised.

1. Make journeys by Walking, or cycling as much as possible and as much as you like.
2. For powered journeys Travel as little as possible – it is extremely costly in CO_2 output.
3. For short, local journeys use public transport. This deserves further comment as follows. Some public transport has a low occupancy rate, this can result in the figures for a particular journey to be worse than doing the same journey in a well filled car. HOWEVER the public transport will run however many passengers are on board (often as a necessary public service) – this means that going by public transport will add only a negligible amount to its CO_2 output.
4. The same is NOT TRUE for AIR flights were if flights are not commercially viable they soon get dropped.
5. If you do use a car for local journeys be aware that the problem not only concerns CO_2 output, but also involves congestion which make our localities unpleasant. The old advert for the bus showing Oxford Street in London where 60 cars were replaced by one bus, remains a telling image.

   So - combine your journeys, to minimise their number – take other people.
4. If you own a "car" make it as small as you can, and make it a diesel. Think about fuel efficiency.(Humbies are Out!). Don't have a big car just because it is nice to travel in, or you feel safer (what about the other fellow?).

5. For long distance travel. Coaches have the smallest CO_2 output, followed by trains, followed by a completely filled efficient and not over-powered diesel car or MPV – but note "completely filled".
6. Air travel should be eliminated, or very severely restricted.

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