



UNIVERSITY OF  
OXFORD



# Assessing the Reality: Transport and Land Use Planning to Achieve Sustainability

**David Banister**

Professor of Transport Studies  
Director of the Transport Studies Unit

University of Oxford



UNIVERSITY OF  
OXFORD

# Introduction

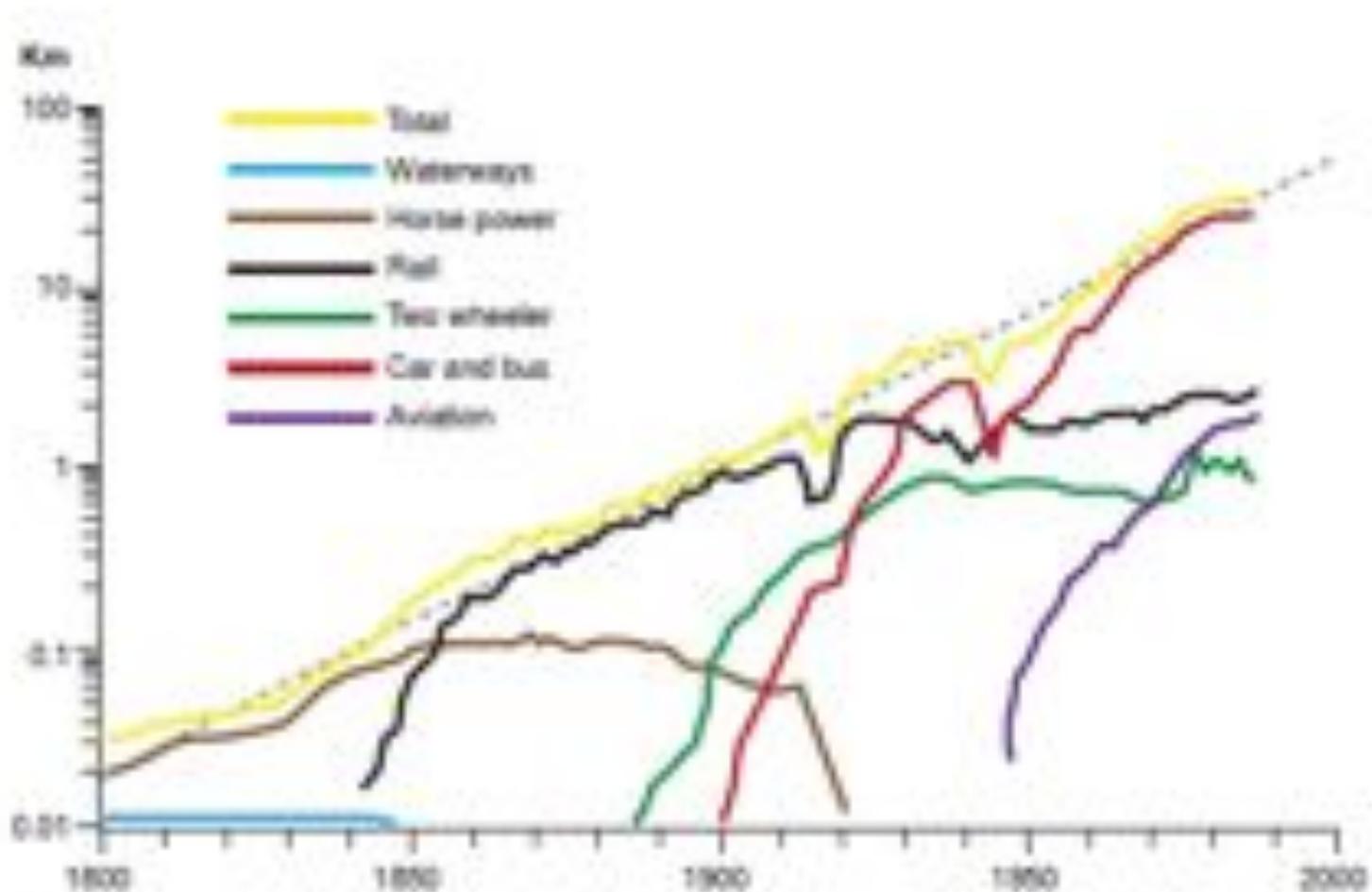


1. Lessons from history
2. The sustainable mobility paradigm
3. Distance: land use planning and development and technology
4. Speed and time: as a social construct
5. Conclusions



# 1. Lessons from History

**Distance travelled in France during the last two centuries (Km/person/day –excluding walking and cycling)**



Source: Grubler, A. (2004) *Technology and Global Change*, Cambridge: Cambridge University Press (138).



# The Growth in Travel Distance



	1950	2005	2050	1950 - 2005	2005 - 2050
	PKT/cap	PKT/cap	PKT/cap	% Change	% Change
Industrialised economies	4530	18400	42200 (29500)	+306.2	+129.3 (+60.3)
Reforming economies	947	5620	15000 (16300)	+493.4	+166.9 (+190.0)
Developing economies	388	3660	6800 (14600)	+843.3	+85.8 (+298.9)
World	1420	6020	11400 (16400)	+323.9	+89.4 (+172.4)

Source: Schafer et al. (2009)

Units: Passenger kilometres travelled per person

Projections for 2050 are based on economic growth rates of the MIT EPPA model reference run and those of the IPCC SRES-B1 scenario (in brackets).

Industrialised economies – North America, Pacific OECD and Western Europe

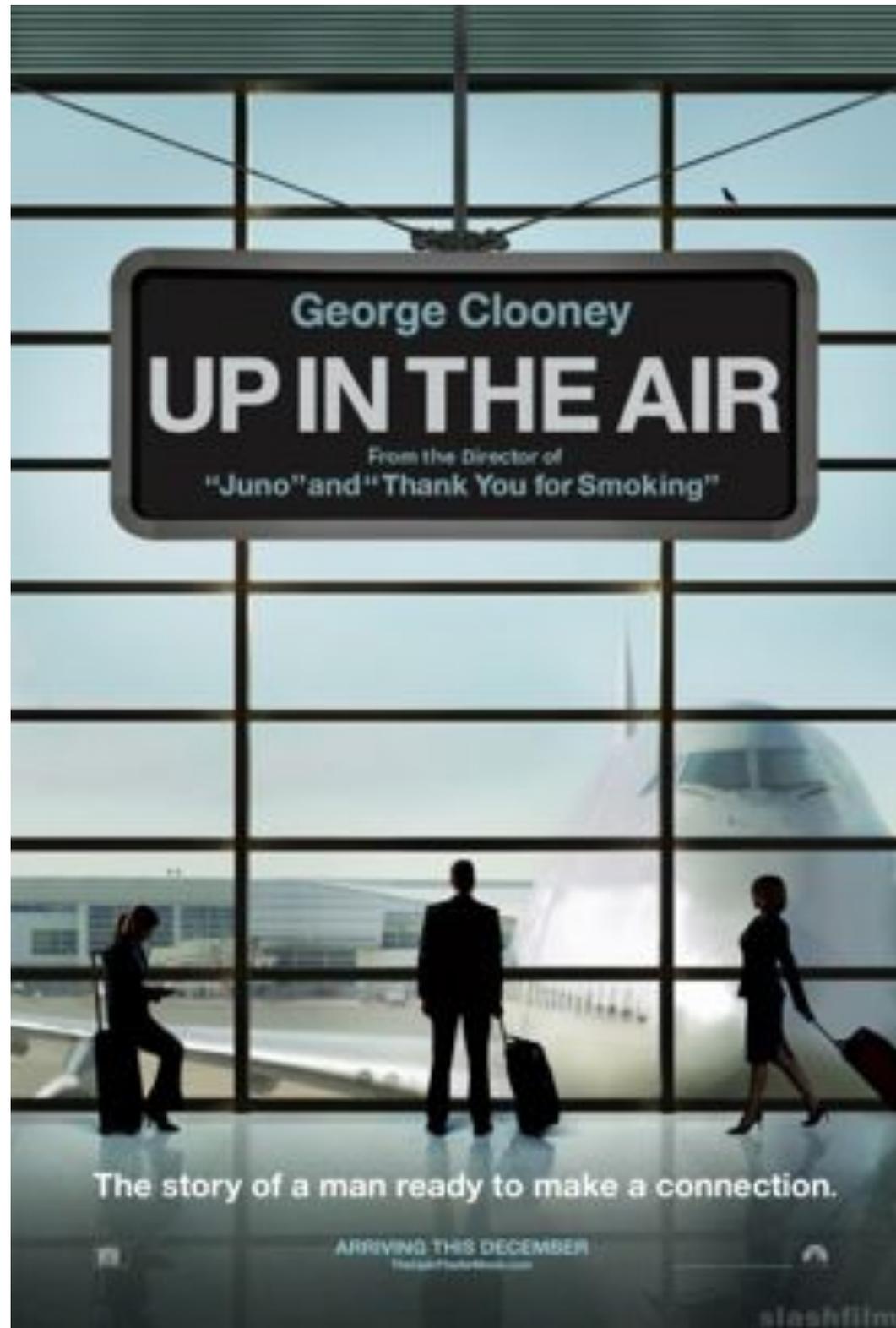
Reforming economies – Eastern Europe and former Soviet Union

Includes all passenger travel – car, bus, rail and air



UNIVERSITY OF  
OXFORD

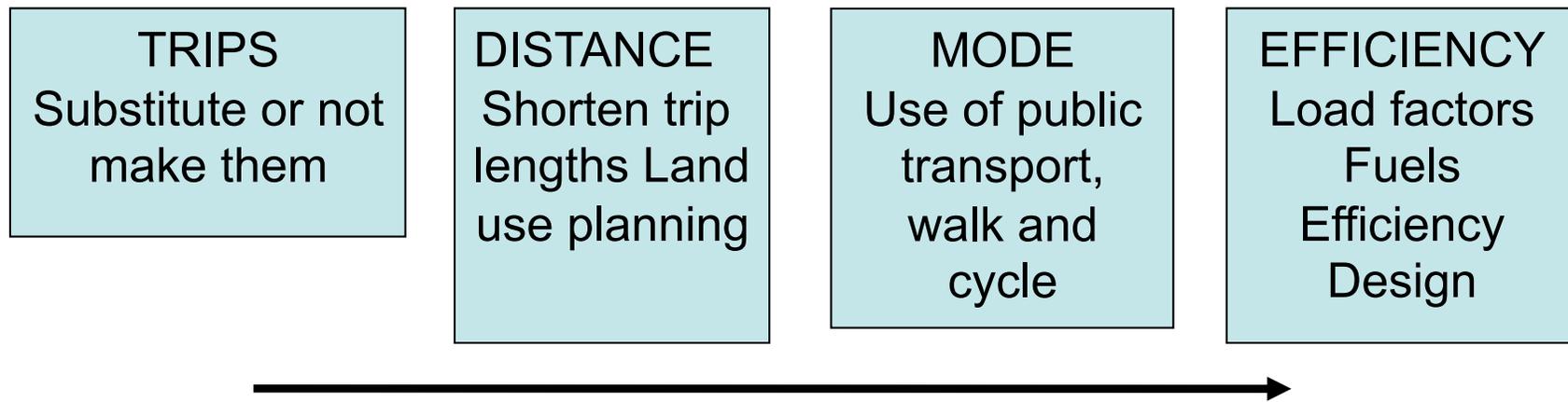
**Where does  
this lead – to  
an air based  
nomadic  
existence?**





## 2. The Sustainable Mobility Paradigm

Space and place seen as distance with a physical measure of travel – planning has an instrumental role in reducing trip lengths (Banister, 2008).



New technologies for transport in cities – distance seen as a limitation as range of vehicles is constrained



UNIVERSITY OF  
OXFORD

### 3. Distance: Land Use Planning and Development



Vision of the city in its desired form – viability, vibrancy and vitality – and the role of transport

Land Use and Development	Scale and Distance
<ol style="list-style-type: none"> <li>1. Settlement size</li> <li>2. Strategic development location</li> <li>3. Strategic transport network</li> <li>4. Density</li> </ol>	<p>Structural issues relating to urban form, mainly carried out at the regional and city levels – Physical distance, speed and proximity operate – longer distances</p>
<ol style="list-style-type: none"> <li>5. Jobs-housing balance</li> <li>6. Accessibility of key facilities</li> <li>7. Development site location</li> </ol>	<p>More local development issues, carried out at the city and local levels – Accessibility by public transport – medium distances</p>
<ol style="list-style-type: none"> <li>8. Mix of uses</li> <li>9. Neighbourhood design + street layout</li> <li>10. Traffic demand management</li> <li>11. Parking and servicing</li> </ol>	<p>Local issues relating to the neighbourhood, where walking and cycling are important, and there is a concern over short distances and slowness</p>

Source: Based on CfIT (2009)



# Policy Analysis of Urban Transport



← Impact on Quality of Life →

Policy Area	Desired Policy Outcome	Economic Prosperity	Health Outcomes	Enjoyment of Space
Roads and Streets	An optimal balance between movement and place functions of roads and streets	Congestion reduction and increased reliability	Increased walking and cycling and less emissions	Easier to navigate and more enjoyable streets
Modal Shift	Enable a wider choice of mode of travel than just the car – active travel and benefit to health and environment	Congestion reduction through increased bus use	Increased walking and cycling and less emissions	Appreciation of local community and environment
Spatial Planning	Encourage the use of spatial planning to develop well connected mixed use urban areas	Reduce need to travel Agglomeration effects	High quality street designs encourages walking and cycling and less emissions	Mixed use areas with less traffic and roads are more pleasant to be in



UNIVERSITY OF  
OXFORD



## Comment

1. Opportunity for flexible use of space
2. Shorter journeys means greater choice of mode of transport
3. Sociable modes – higher value on people and community (Gehl, 2004)





UNIVERSITY OF  
OXFORD



### 3. Distance: Technology

**Much debate about the role of EVs in cities**

1. Most trips are short distance – London 60% < 5kms
2. Greenest transport = walk and cycle
3. Potential for greater use of public transport
4. New technology – niche, transition costs, incentives



**Access for cars  
to cities limited  
to EVs and  
most efficient  
ICEs**



5. Consumers are low risk takers and want no change?



UNIVERSITY OF  
OXFORD



1. Trip lengths and accessibility
2. Motorbility – role of car in city
3. Ownership – sharing and rentals
4. Reallocation of space



"I call on Londoners to sign up and become pioneer members." - Boris Johnson



Journeys under 30 minutes are free

Click the arrows to find out more





UNIVERSITY OF  
OXFORD



# Comments on Distance

## Urban Form Matters

1. Clear separation of space and different types of use - proximity
2. The role of car in the city – and the role of technology to complement reductions in trip distances – slow more local travel
3. Co-benefits of reductions in travel distances – through shorter trips (and times), through safer travel, through better air quality, through reductions in GHG, through quieter spaces and through greater physical activity



## 4. Speed and Time

Speed and time central to transport analysis – and travel as a derived demand with the aim to minimise the generalised costs of travel – the expectation is that distances should be short

### The Changes in Travel Distance in Great Britain (1972/1973 – 2009)

Trips/miles/hours/minutes/number						
Year	Number of trips per person per year					
	All trips	Trips of 1 mile or more	Distance travelled (miles)	Time taken (hours)	Average trip length (miles)	Average trip time (minutes)
<b>1972/73</b>	956	594	4,476	353	4.7	22.2
<b>2002</b>	1,047	819	7,135	380	6.8	21.8
<b>2009</b>	973	774	6,775	372	7.0	22.9



UNIVERSITY OF  
OXFORD

## Comment on Speed



1. Economic notions of more choice through greater speed – individual benefits higher than societal welfare
2. Social costs as not all people have access to the car – some 30% of the total population are not able to drive
3. Environmental costs are also high – need to ‘decarbonise’ transport as higher speeds use more energy



Giacomo Balla 1913

Abstract Speed - the  
car has passed



# Travel Time and Travel Time Budgets



1. Travel time central to transport – desire to ‘save’ time – as travel time is viewed as ‘wasteful’ (Bruce Hamilton, 1989) and travel time should be minimised
2. Transport appraisal almost totally (80%) dependent on user benefits resulting from time savings – hence the overwhelming desire to speed up travel
3. Travel time budgets – in the UK about 62 minutes a day – and these have remained constant over time (NTS)
4. Different figures from the UK time use survey suggest a higher figure of about 72 minutes a day
5. Ignores international travel – increasingly important and the huge variability between people

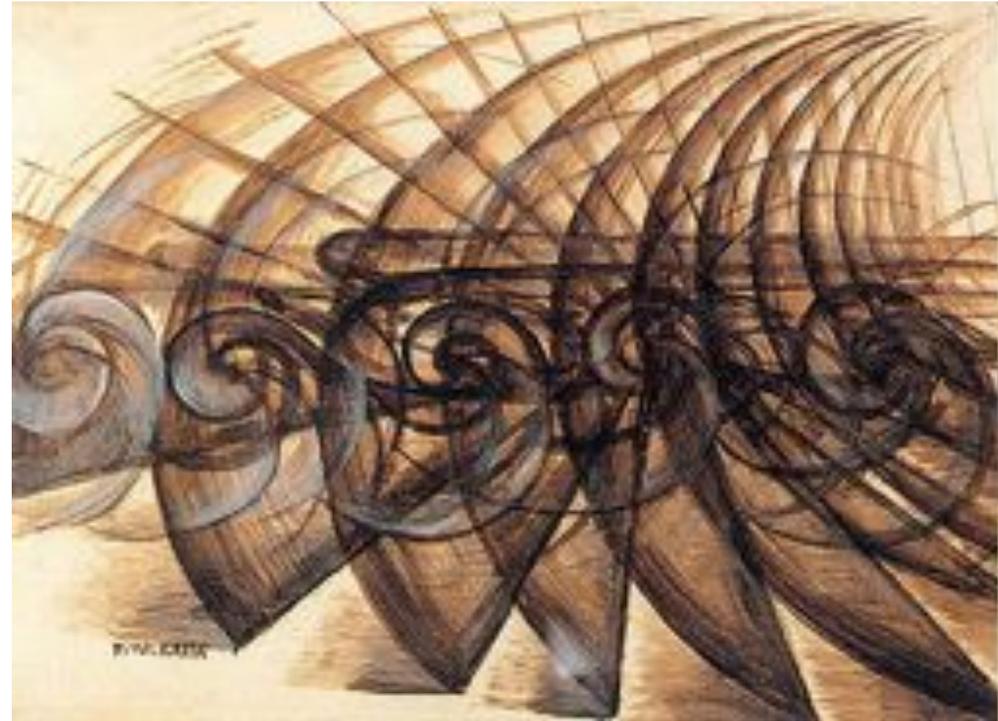


UNIVERSITY OF  
OXFORD

## Comment on Time



1. Can time be viewed in a more creative way as it varies between individuals and over time
2. Rather than concentrating on time reduction, the means by which travel distances can be reduced should become part of the debate
3. Can travel time be seen as having a value and can be used productively



Giacomo Balla 1913

Speed of a motorcycle  
frozen in time



UNIVERSITY OF  
OXFORD

# Time as a Social Construct



Travel time as a social construct – not new – but the means by which the quality of it can be maximised and highly valued

Understanding how people use and experience travel time

1. Embodied and relational time
2. Cultural constructs of time
3. Social differences

Need to balance economic values of time and speed with an deeper understanding of values and preferences



## 5. Conclusions

1. Travel can no longer be seen only as a derived demand with no positive value in the activity of travel – it has more than instrumental value
2. It has value in terms of experience, reliability and quality – meaning that issues of travel distance need to be firmly embedded in an understanding of behaviour and culture
3. Commodification of time results in the dominance of one aspect of time – travel time – but the reality is more complex – on links between technology, flexibility in the use of time, compression of time, and reorganisation of networks



UNIVERSITY OF  
OXFORD



4. Distance increases have been the consequence of higher speeds and stable time budgets
5. The sustainable mobility paradigm argues for shorter distances, slower travel and more attention being given to the quality of the experience
6. Travel in the city is seen as a multitude of shorter journeys using combinations of walk , cycle and public transport
7. The role of the car is limited – rented or shared – and the dominance of the city car culture is challenged
8. Such a vision addresses the economic, social and environmental concerns that are central to the transport debate



UNIVERSITY OF  
OXFORD

This third painting from the Futurists illustrates the need to rebalance the dominant speed – time transport paradigm, and to reduce travel distance through the adoption of the sustainable mobility paradigm



*This painting of the "Dynamism of a Cyclist" 1913 by Umberto Boccioni demonstrates the Futurist interest in film. Borrowing from Cubism, the Futurists were interested in the dynamics of speed and the simultaneity of the image in motion. Boccioni also created sculptures, which attempted to free the object from its traditional status, creating instead, a fluid medium infused by technology and raw energy.*