2nd Oxford Civic Society Symposium on Transport and the Future of Oxford: Ten Years On: 12th November 2011

SUSTAINABLE TRANSPORT LOOKING INTO THE FUTURE

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The Big Issues

⇑ Urbanisation

⇑ Population

Alleviating poverty

⇑ Energy demand

Climate Change

⇑ Water demand

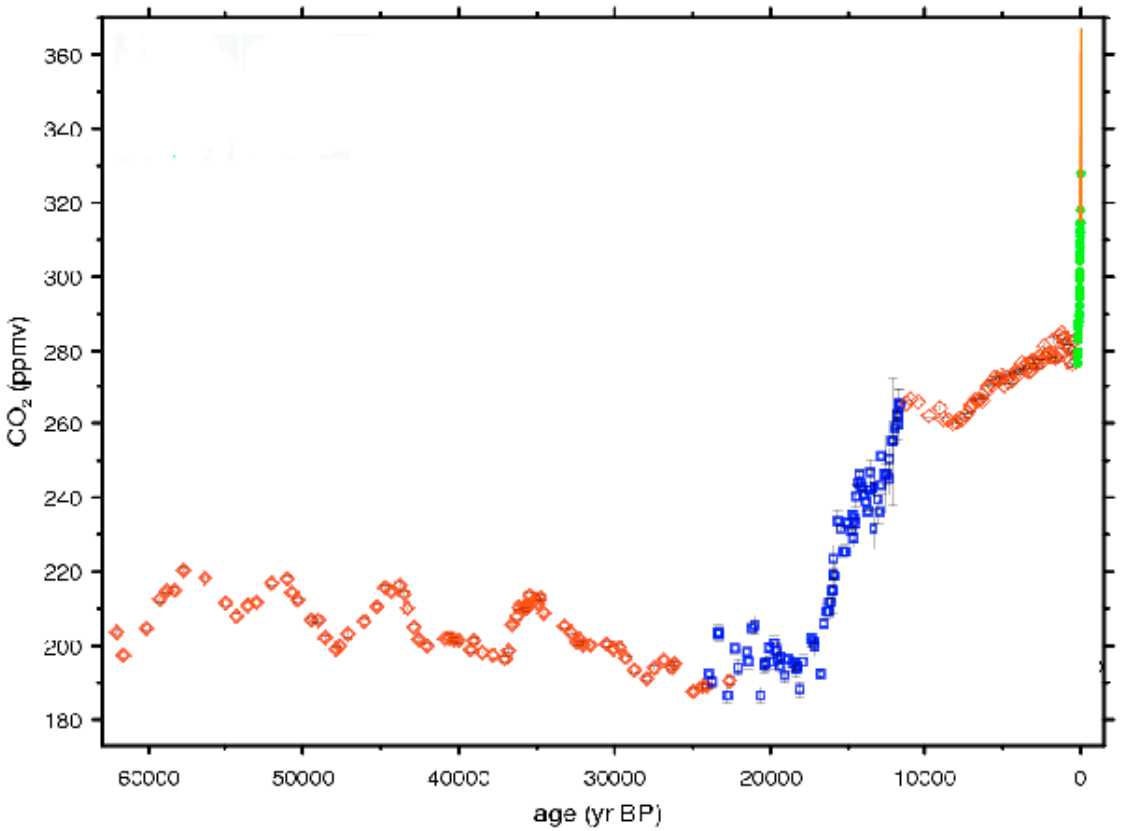
Food security

Infectious Diseases

From John Beddington's lecture at Oxford University

23rd June 2009

The New Imperative



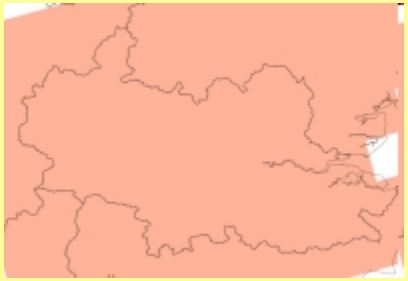
Estimates of 390 CO_2 ppmv 2009

Carbon Emissions – tCO_2 per person (2008)

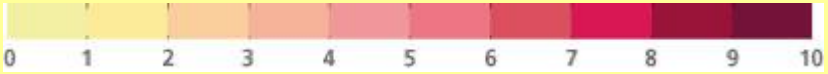
	Total	Transport
Global	4.38	1.00
EU27	7.72	1.89
USA	18.35	5.54
Target	2.00	0.75
China	4.91	0.34
India	1.25	0.12

Source: IEA (2010) CO_2 emissions from fuel combustion, Paris: IEA Statistics, November

2080s 50% Probability Level: Central Estimate

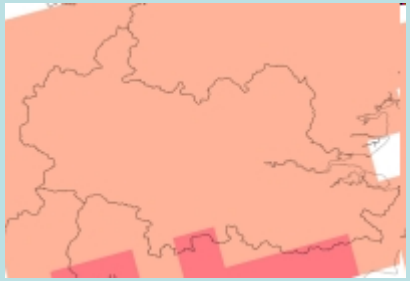


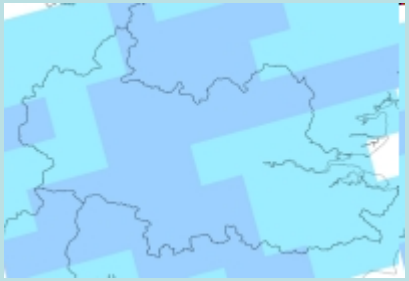
Change in annual mean temperature (ºC) Medium emissions = +3.5C

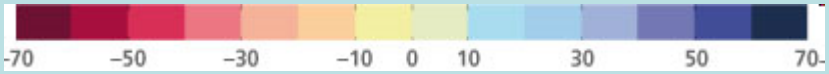


Change in summer precipitation (%) Medium emissions = - 21-31%

Change in winter precipitation (%) Medium emissions = +19-21%







UKCIP09 Projections

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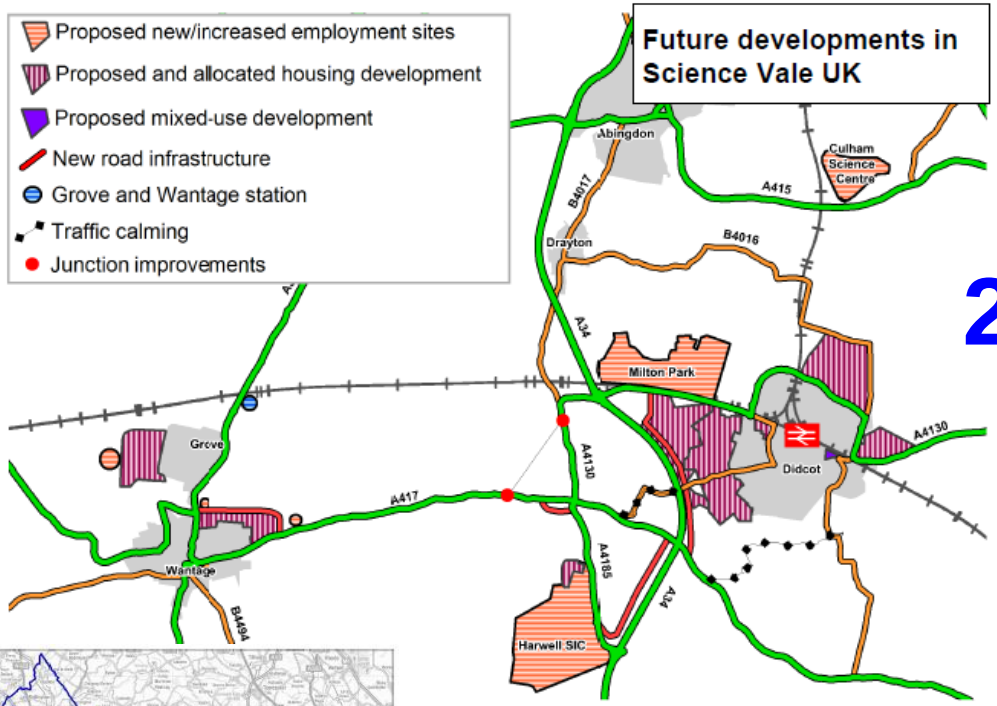
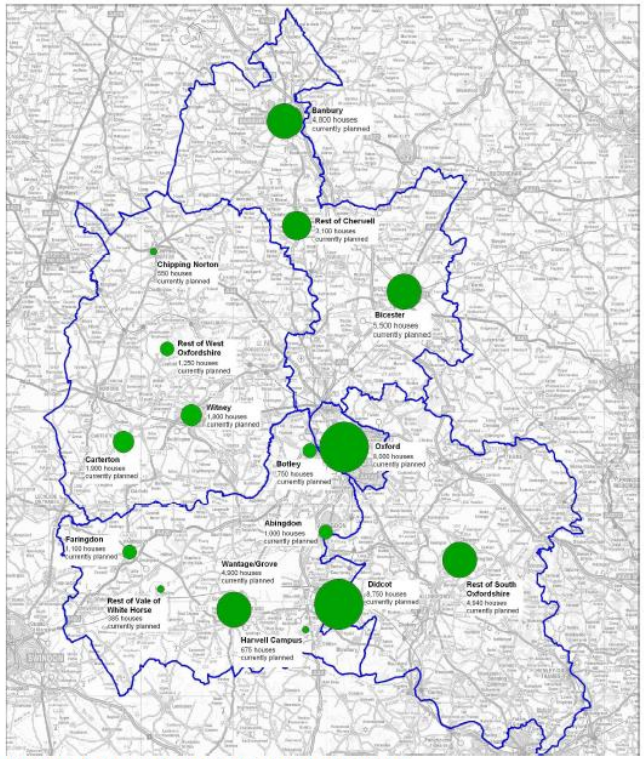
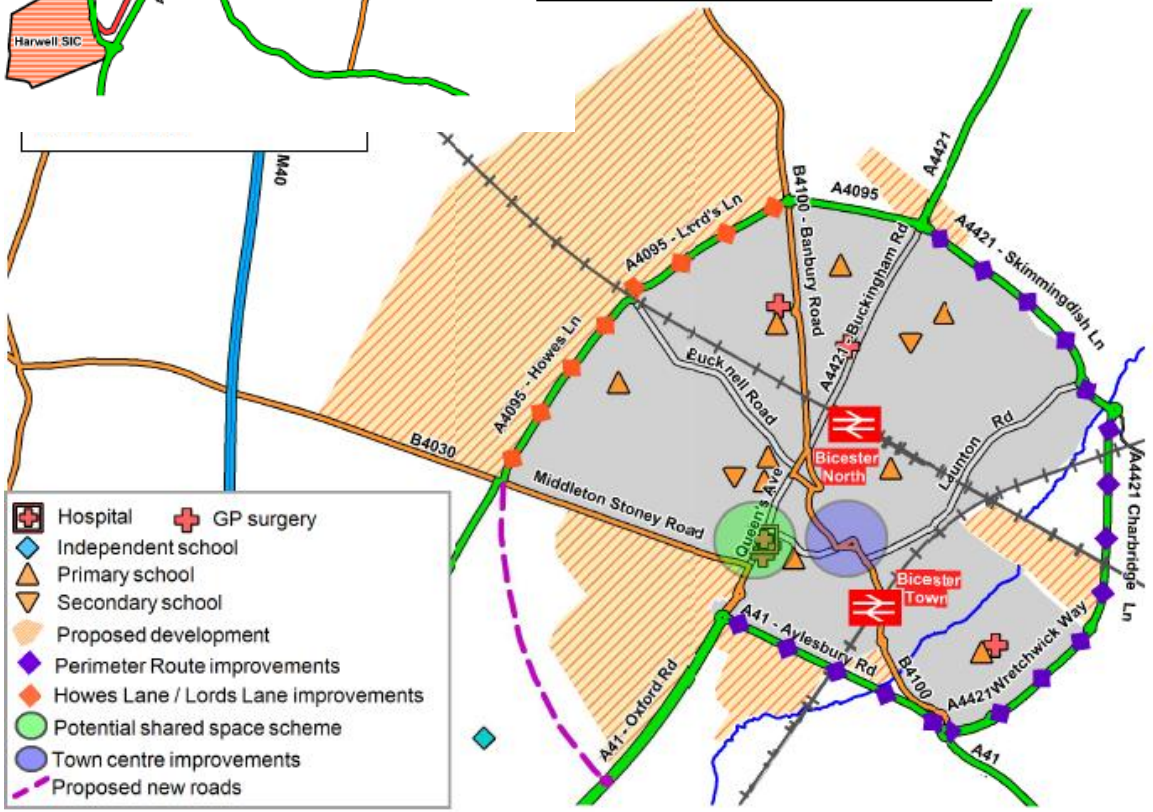
2030 Vision for Oxfordshire





Future housing developments to 2026

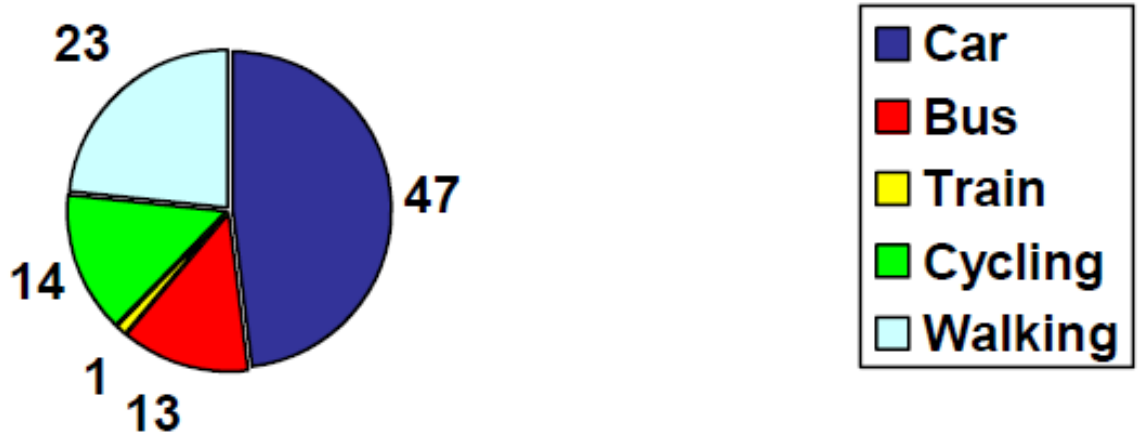
Future developments in Bicester



Oxford – Travel Patterns (2008)

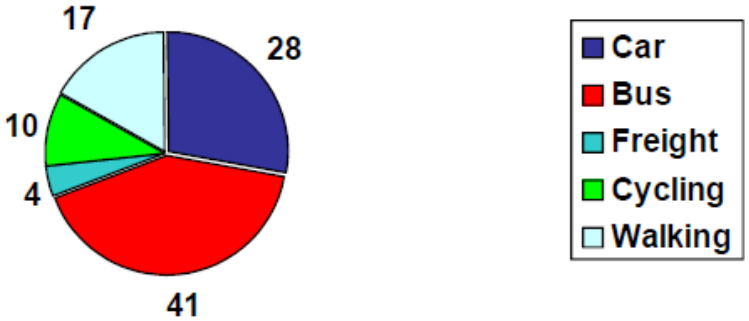
Modal Share, Trip Stages, All Purposes

Source: Access to Oxford (2008)



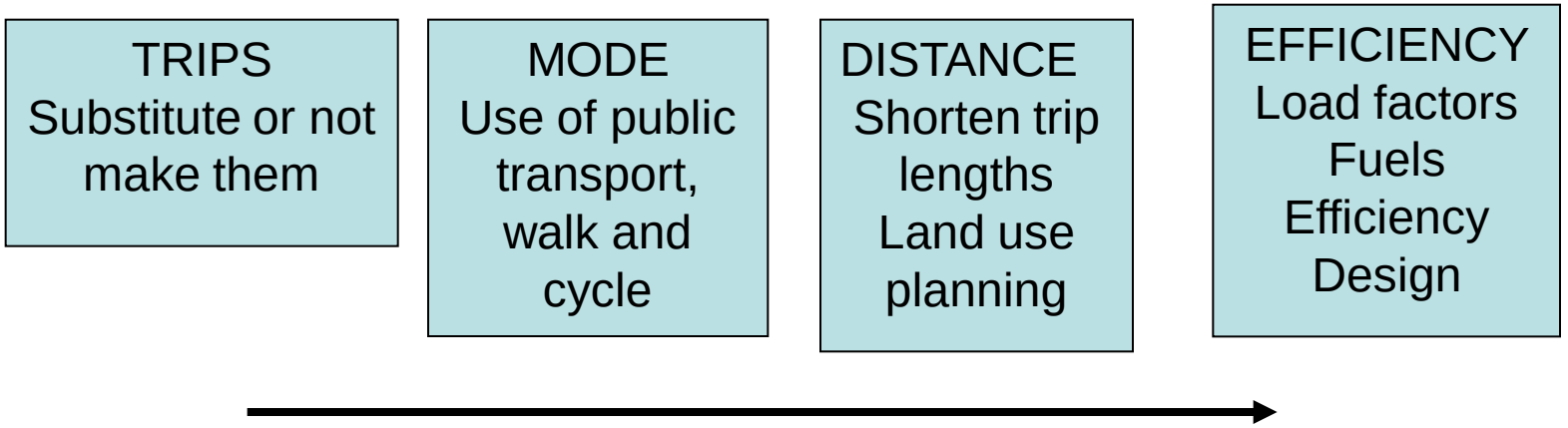
Trips to Oxford City Centre

2008 County Council cordon count



Steve Melia (2008) Transport Energy Descent Plan for Oxford

Sustainable Mobility Paradigm



Sustainable mobility explores ways of travelling less rather than travelling more, to overcome the problems of capacity, and also to address the environmental imperative.

1. Reducing the need to travel – substitution

- Trip no longer made – replaced by non travel activity or substituted through technology

2. Transport Policy Measures – Modal Shift

- Promotion of walk and cycle
- Slowing down of urban traffic
- Demand management
- Investment in public transport
- Flexible use of streets
- No rebound effects

3. Land Use Policy Measures – Distance Reduction

- Build sustainable mobility into patterns of urban form and layout
- Increase densities and concentration – mixed use developments, housing location

The New Oxford Cancer Centre at the Churchill and Susan Roaf's Eco Home

4. Technological Innovation – Efficiency Increase

- Best available technology – lean burn and plug in hybrids
- Alternative fuels – renewable electricity and Biofuels (?)
- Restrictions – clean parts of the city
- Ecological driving and slower speeds
- Increase load factors

Technological Transitions

1. Niche markets and not a replacement
2. Consumer preferences – low risk and no change
3. Transition costs
4. Greenest transport = walk and cycle

The 90% EV Option by 2050 = 20% global electricity or about 2000 GW of additional capacity

The Electric Vehicle Option

1. Sufficient capacity and infrastructure
2. Charging regime – timing, swaps, high voltage
3. Battery performance and driving behaviour

Plug-in vehicle battery capacity	Vehicle driving range on batteries (km)	Battery storage required (kWh)	Li-ion Battery Cost (US$)		Percentage average daily driving on battery (%)
			Current (1000/kWh)	Future (300/kWh)	
Low	20	5	5000	1500	20-40
Medium	50	12.5	12500	3750	40-60
High	80	20	20000	6000	60-80

4. Costs of the battery and the vehicle - leasing

Conclusions - Five Key Issues for Sustainable Transport in Cities

1. **Vision of the city** in its desired form – Viable (economic), Vibrant (social and cultural) and Vital (healthy and environmental) – role of transport in achieving this

2. **Positive role that planning and spatial development** can have in helping achieve the Vision – reducing vehicle miles travelled by car, promoting shorter distances and encouraging all modes of transport – walk and cycle.

3. Technological transition to a low carbon transport system have positive impacts from reduced CO2 and other pollutants, but limited health and safety benefits – **the technical is really social**.

4. Improving the **quality of life in cities** – conflicts between place, space and movement – proximity.
5. **Participation and acceptability key**, with increased sense of ownership and pride in city space – leadership and involvement