option, ranges from 60% to 67% of all trips. The reason that car travel continues to be so popular could be that it is arguably more flexible and more comfortable than public transport, and for many recreational, social and business journeys, there are few viable substitutes at present. When reliable, rapid public transport is available to all and the pattern of development is served by it, as in the Transport Links and New Towns options, patronage increases from 5% of total, to 9% and 12%, respectively. But the impact on car travel is rather less, reducing by between 3% and 10% only.

Table 6.1 illustrates the impact of each option on road congestion in the Cambridge urban area and in the sub-region area as a whole. It can be observed that apart from the Virtual Highway option which does not add much to congestion in the city or outside it, travel time in all the other options is set to double within Cambridge and increase from 40% to 87% for the sub-region as a whole.

The increase in fuel consumption, and subsequent emissions and pollution will be largest in the Green Swap (+74%) and Densification options (+68%). Due to queuing and stop/start traffic flow, pollution within Cambridge will increase substantially in these options. It may be necessary to implement a high-quality public transport system, such as light rail or similar, to attempt to re-direct the increase in car traffic to public transport. The other options, such as Minimum Growth and Necklace, emerge as the next largest fuel consumers, which increases by 56–60%. These options would also increase emissions from motor vehicles and thus pollution, which would mainly occur around the access roads to Cambridge. The best options, in terms of fuel consumption, excluding the Virtual

Table 6.1
Relative change in road travel in the options in 2016 (1991 = 100).

Options	Cambridge urban area			Cambridge sub-region			
	Travel time	Travel distance	Travel delay	Travel time	Travel distance	Number of trips	Fuel consumption
Average	**206**	**116**	**317**	**161**	**121**	**136**	**153**
1 Minimum Growth	215	116	338	179	129	142	156
2 Densification	238	120	383	176	124	143	168
3 Necklace	226	116	362	184	128	143	160
4 Green Swap	253	121	417	187	123	143	174
5 Transport Link	197	114	258	141	113	130	148
6 Virtual Highway	112	101	122	105	108	115	107
7 New Town	201	123	257	158	123	137	155

Highway option are Transport Links (48%) and New Town (55%), mainly due to increased rail use.

Economic implications

Exporting firms in the primary, secondary and tertiary sectors would suffer rising costs of varying degrees under each option. Where the rises are steep, firms would find difficulty in competing with products and services from more competitive regions in the rest of the country and beyond. As illustrated in Figure 6.5, the Minimum Growth and New Town options indicate the highest export cost rises to 2016 and beyond. The Densification and Green Swap offer the lowest increase to 2016. In between these two extremes lie the Transport Links, Necklace and Virtual Highway options. The range of annual cost increases faced by exporters would lie between 1% and 3%. The tertiary sector – higher education and high technology – would suffer higher-cost options, which could adversely affect economic growth in the area, to the detriment of the country at large and to research in general.

The export unit cost index has been selected as the indicator to measure the economic sustainability of the options. It

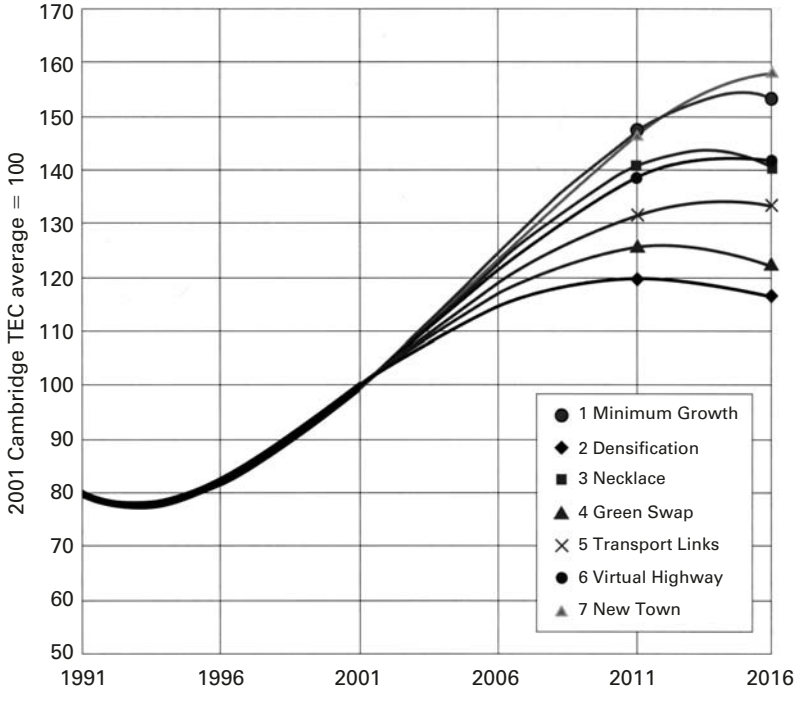

Figure 6.5
Average export unit cost index 1991–2016 for each option. TEC: total export cost.