Driving Sustainability
Can the Auto Sector deliver sustainable mobility?
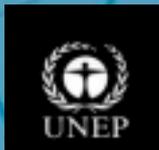
Environment
Air Quality
Acid rain
Photochemical Smog
Heat Islands
Climate Change
Noise and Vibration
Run-off from
Paved Surfaces
Landfill
Fragmentation of
Habitats

Financial Markets
Shareholder
Value Added
Financial Liabilities
Socially Responsible
Investment
Sustainability Ratings
Market Trends
and Opportunities
Tipping Points
Business Case

Life Cycles
End-of-life Vehicles
Design for
Disassembly
Closed-Loop Systems
Factor 20
Dematerialisation
Detoxification

Emerging Economies
'Raising the Bottom'
Economic Development
Mobility Needs
Technology Transfer
Leapfrogging
Population
Demographics

Technology
Alternative Fuels
Hybrid Vehicles
Hypercar
Fuel Cells
Hydrogen Economy
World Cars
Telematics

SustainAbility   United Nations   Gordian Knots
                 Environment
                 Programme

Content and Format

As with other **SustainAbility** reports, *Driving Sustainability* is available both as a printed report and as an electronic pdf (portable document format) file. Reports can be ordered in either format (and electronic files can be downloaded) from the **SustainAbility** website: www.sustainability.com [02]

As readers work through the following pages, they will also find password-protected URLs which will link them to extra resources and ongoing work in the sustainable mobility field. However, access is only available to purchasers of *Driving Sustainability*: a password will be issued with each report sold.

01   Gordian Knots

Gordian knot: n. 1 An intricate knot tied by Gordius, king of Gordium, Phrygia, and cut through with a sword by Alexander the Great in response to the prophecy that whoever untied it would become the ruler of Asia; 2 An indissoluble bond; a difficult problem or task. Cut the Gordian knot: solve a problem with a radical solution, esp. one that eliminates the conditions that caused the problem in the first place. [03]

Climate Change
Global Warming
Greenhouse Gases
Emission Ceilings
Zero Emissions
Renewable Energy

Internet
CNN World
E-specification
E-purchasing
Real-time Manufacturing
Intelligent Vehicles
On-board
Entertainment
New Customer
Strategies

Social
Employee Relations
Employee Training
Health and Safety
Equal Rights
Diversity
Community Relations
Plant Closures
Human Rights

Introduction

Driving Sustainability is the latest report in **SustainAbility**'s *Engaging Stakeholders* series, and our third sector report.[04] Launched in 1994, our joint initiative with the **United Nations Environment Programme** (**UNEP**) adopted the title *Engaging Stakeholders* in 1996, with a two-volume study of that name. Each of the thirteen reports published to date has explored a different dimension of the corporate accountability and sustainability agendas. The early aims of the joint program were to:

— Promote wider and more honest environ-mental (and now sustainability) reporting;
— Catalogue and analyse sector trends;
— Track and evaluate trends in the main world regions;
— Review and respond to the latest corporate reporting; and
— Explore the links between current reports and sustainable development reporting.

That said, the focus of the *Engaging Stakeholders* program has expanded to embrace such areas as:

— Internet reporting;
— The convergence of sustainability reporting with mainstream corporate annual reporting; and
— Corporate triple bottom line performance.

Driving Sustainability builds on the foundations laid by *The Global Reporters*, the first international benchmark survey of corporate sustainability reporting.[05] It also draws on internet reporting by automotive companies, looks at the degree of convergence between stand-alone sustainability reports and mainstream corporate reporting, and raises challenging questions around performance.

As the complexity of the agenda evolves, and with it the sophistication of business responses, we need to tackle some of these issues in different ways. *Driving Sustainability* is the first in a planned series of reports focusing on sectors where the sustainable development agenda is so complex — and so recalcitrant — that it is reminiscent of the 'Gordian Knot' problem (see Figure 01). According to legend, Alexander the Great was once faced with a knot so intricate that no-one had ever been able to untangle it. So he sliced through it with his sword.

The key question: Are the relevant automotive sector companies aware of the scale of the challenge they face and responding with the appropriate level of energy and — Alexander's lesson — radicalism? Can they deliver sustainable mobility? The answer, we believe, is that they have much to offer, but — on the evidence of their published reports — most are only just beginning the journey sketched out in the following pages.

Aims & Methodology

A key aim of the 'Gordian Knot' series of reports will be to help business and its key stakeholders think about complex issues — and understand why, where and how best practice is emerging and can best be emulated.
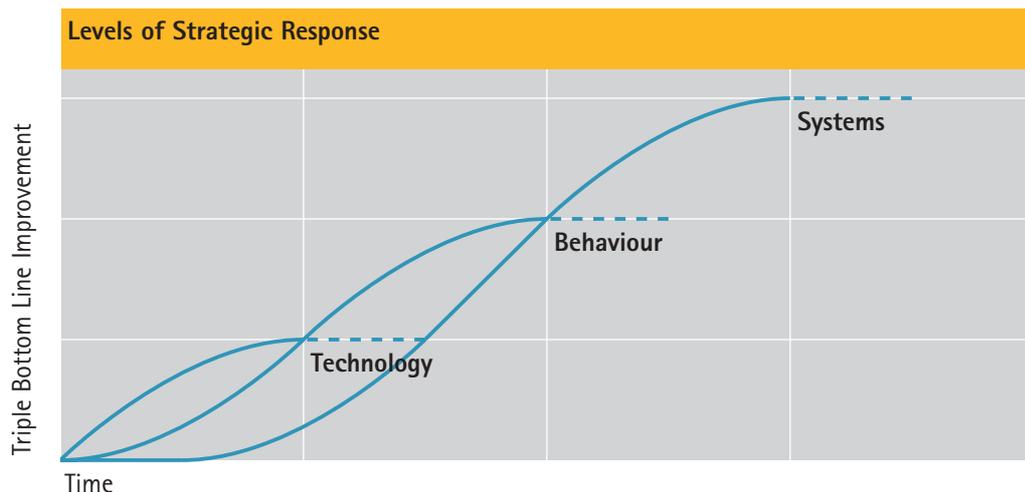
Driving Sustainability is not a benchmark of company performance in the automotive sector. Instead, it focuses on the ways in which a number of leading companies in the sector are defining — and responding to — the sustainable mobility agenda.

Definitions of sustainable mobility can be found on page 03, but for present purposes we can say that the central objective is to develop and operate access, mobility and transport systems in ways that satisfy the triple bottom line of sustainable development.[06] The specific aims of the report are to:

— Identify a sample of leading automotive sector companies that are — or should be — responding to the 1999—2000 sustainable mobility agenda.
— Explore how these companies understand the agenda — and the actions they are taking, or planning to take, in response.
— Assess how transparent and accountable the sector is in terms of the strategies it is developing and implementing.
— Consider the extent to which there are significant differences between world regions with respect to their understanding of — and responses to — the agenda.
— Provide guidance on how sustainable mobility reporting will evolve.

SustainAbility has worked with a number of auto sector companies, including **Volvo** and **Ford Motor Company**; however, the main sources of information used for this study were publicly available corporate information and research reports by other organisations. We looked at annual reports, environmental and sustainability reports, and company websites. In addition, we interviewed analysts working for such firms as Standard & Poors (S&P) and Sustainable Asset Management (SAM), and convened an Advisory Panel.[07]

1.0 Executive Summary

Levels of Strategic Response

Triple Bottom Line Improvement

Technology

Behaviour

Systems

Time

Survey Sample

Ten companies (later referred to as the **Automobility–10**) were selected for analysis. **GM** Chairman Jack Smith's comment on the structure of the industry helps explain why we opted for this sample size. The Big 6 now account for 80% of the global market, according to a recent market survey by analysts NikkoSalomonSmithBarney.[08]

The **Automobility–10** were chosen mainly for their stake in the market in terms of size, market share and influence. Where companies were owned, either wholly or significantly, the dominant company was selected for benchmarking. So, for example, the Volvo Car Corporation is now owned by **Ford**, so in this case we focus on **Ford**. The final selection is as follows:

1 **Bayerische Motoren Werke** (BMW), Germany
2 **DaimlerChrysler** (DC), Germany
3 **Fiat**, Italy
4 **Ford Motor Company** (Ford), USA
5 **General Motors** (GM), USA
6 **Honda**, Japan
7 **PSA Peugeot Citroën** (PSA), France
8 **Renault**, France
9 **Toyota Motor Corporation** (Toyota), Japan
10 **Volkswagen** (VW), Germany

The selection originally included four companies from emerging economies. However, the amount of publicly available information on these companies turned out to be severely limited and our requests for more information generally fell on deaf ears. The additional companies were:

— **Daewoo**, South Korea
— **Hyundai** (including KIA), South Korea
— **Maruti**, India
— **Proton**, Malaysia

Key Results

On the basis of our assessment, we outline some key findings:

— The sustainable mobility agenda richly deserves 'Gordian Knot' status: it is horribly complex. To make it more manageable, we carve it into four key issues (climate change, life cycles, liveable cities and emerging economies).

— Most major companies operating in the international automotive sector are increasingly aware of the sustainable mobility agenda, as evidenced by the World Business Council for Sustainable Development work in this area.[10] However, the strategic intent of even the lead actors is far from clear.

— The **Automobility–10** will be critically important if we are to develop marketable solutions. But we should not count on an industry that has caused many of the problems to develop solutions that cut across its vested interests. The role of governments will become increasingly important.

— As the boundaries of responsibilities of car companies expand, they will need to contribute to solutions for SM technology, behaviour and systems. To do this effectively, they will have to be transparent and proactive in their engagement in the public policy debate.

— The overall average score for the automotive industry in SustainAbility's Issues benchmark, devised specifically for this report, is 34% (Figure 02). **DaimlerChrysler** has the highest score of 50% (10 out of a possible 20 points).

— There is a good deal of diversity: the language and definitions vary widely, as do the priorities identified and addressed in corporate strategies and initiatives.

02 Automobility–10 Issues Scores

% Average Score 34%
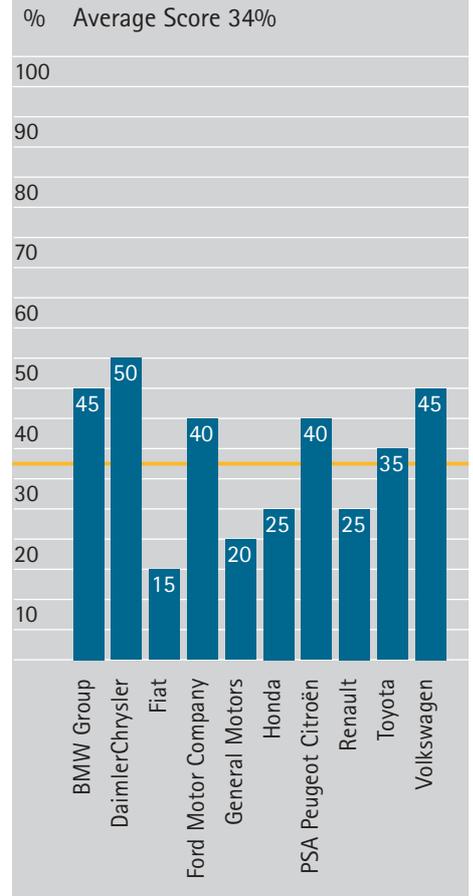
— Companies show signs of transformation, although their efforts are so far focused on climate change and life cycles, rather than on liveable cities or the emerging economies (see Figures 20–23 below).

— **VW** tops our Global Reporters benchmark of the automotive manufacturing companies, based on sustainability reporting only (more detail on page 11).

'The market is really six large groups now, with three very independent companies. Virtually everyone else is affiliated with one of the six major groups.'
Jack Smith
Chairman, General Motors[09]

Climate Change	Life Cycles	Liveable Cities	Emerging Economies

SustainAbility Foreword

Driving Sustainability is SustainAbility's first report using the metaphor of the 'Gordian Knot'. This latest *Engaging Stakeholders* project focuses on sectors whose triple bottom line impacts are extremely complex. The auto industry, a make-or-break sector for sustainable development, seemed a good place to start.

With several auto-makers celebrating their centenaries, we should be thinking long and hard about the future of a product which has become the epitome of western culture. Whatever critics may argue, the automobile is a potent symbol of personal freedom, consumerism and status. As a result, it is central to the hopes and dreams of millions — indeed billions — of people. At the same time, however, the environmental, social and economic impacts of the automobile are becoming increasingly problematic.

Initially, we planned to focus on the industry's accountability for sustainable mobility solutions and strategies. But the weak coverage of such issues in current company reports persuaded us that it would be more effective to strip the agenda down to just four key issues: climate change, life cycles, liveable cities and emerging economies. We hope our short report encourages auto-makers to engage openly in the debate on future mobility solutions — and to report more comprehensively on their strategies, progress and inevitable mishaps along the road.

Alex Cutler
John Elkington
Tell Münzing
SustainAbility

UNEP Foreword

The United Nations Environment Programme is pleased to introduce the third sector report in the *Engaging Stakeholders* series, which examines the reporting of environmental and social issues in the automotive sector.

At a time when the findings of the UN International Panel on Climate Change are more and more alarming, the report is a timely reminder that the ever-increasing road transport sector has significant environmental impacts. These impacts include 80% of transport-related CO_2 emissions, local and regional air pollution, land-use changes and road congestion.

Over the past decade, these impacts have been targeted by NGOs and the public at large, who demand more and better transparency from the automotive industry. Designing innovative environmentally sound transport policies is now a priority in many national and local government agendas.

The report recognises the efforts made by the industry to reduce environmental impacts of production and use through improved vehicle technology. However, new technology needs to go hand in hand with changes in consumer behaviour and alternative mobility concepts. And to achieve the latter, manufacturers need t o work closely with their stakeholders.

In line with the Global Compact, launched in 1999 by the UN Secretary General Kofi Annan, a number of leading automotive companies have engaged in public-private partnerships and stakeholder dialogues, such as UNEP's Mobility Forum. Most automotive manufacturers have responded to increased calls for corporate accountability and transparency by publishing environmental reports while some have started to follow the 'Global Reporting Initiative' guidelines.

These guidelines set a common framework for environmental and social reporting and are promoted by UNEP together with the Coalition of Environmentally Responsible Economies.

By shedding some light on both "best reporting practice" and remaining challenges for the industry, this report will lead to increased understanding of transport issues. It is our hope that it will also stimulate more debate with stakeholders and catalyse corporate engagement in a partnership approach, that will deliver sustainable mobility.

Jacqueline Aloisi de Larderel
Director, United Nations Environment Programme (UNEP) — Division of Technology, Industry and Economics (DTIE)

Jacqueline
Aloisi de
Larderel

Alex
Cutler

John
Elkington

Tell
Münzing

Why Sustainability?

The automotive sector leaves broad, deep tracks. Take all the inputs to, outputs from, and activities involved in the automobility sector, and you account for a considerable proportion of mankind's impact on ecosystems and the planet. As a result, the problems associated with automobility represent — or link back to — many of the most problematic strands in the overall Gordian Knot of sustainable development.

But, before we focus on automobility, why is sustainability itself becoming such an issue? Population growth, coupled with technologies and lifestyles that produce larger environmental and social footprints than their traditional counterparts, have been key concerns driving the sustainability agenda. Deeply entrenched problems resulting from this 20th century lifestyle, such as poor air quality, ozone depletion, climate change, deforestation, fresh water scarcity and biodiversity loss have helped fuel public concern. Social concerns such as labour conditions, human rights and social exclusion are also global problems.

At the same time, there has been a growing interest in the roles and responsibilities of business in both causing and solving such issues. As a result, sustainable development has been on the political and public policy agendas since the 1980s, but the level of business interest accelerated considerably through the 1990s. In particular, the build-up to the 1992 Earth Summit in Rio de Janeiro gave the agenda new momentum, although the 2002 Earth Summit in Johannesburg will draw attention to just how many of the 1992 commitments and targets have been ignored or missed.

BMW

A central problem is this: The sustainability agenda is not difficult to sign up to, but in many countries and sectors it is proving very difficult to implement. One early step for many leading companies has been to embark upon environmental, social and/or sustainability reporting. The *Engaging Stakeholders* program has been among a number of initiatives promoting the closely linked concepts of corporate transparency, responsibility, accountability and, ultimately — if by no means automatically — sustainability.

Our series of sector studies is designed to explore how the triple bottom line agenda of sustainable development cuts across — actually or potentially — the interests, strategies and operations of key companies, industries, sectors and value webs.

Why Automobility?

Twentieth century industrialism was massively shaped by what has been dubbed 'Fordism'. There had been a number of 'horseless carriage' manufacturers before Henry Ford founded his company in 1903, but **Ford**'s early embrace of mass production helped shape the industry for decades to come. Now, roughly 100 years into the automobile era, most people accept that automobility has brought radically improved levels of access to goods and services to a growing proportion of those living in the OECD world, and to a lesser degree, to those in the less developed regions of the world.

But most people, including the CEOs of some major automotive manufacturers, would also now acknowledge that the accelerating use of the private motor car has brought with it a mind-numbing range of challenging problems.

Automotive manufacturing companies have so far avoided a great deal of responsibility for the widespread impacts of their product. The following collection of statistics reveals a huge, global problem. It is no co-incidence that the growing transparency expected of the corporate sector generally will raise some hefty questions that the automotive industry particularly may be ill-prepared to address:

Global Car Markets
The world's car fleet exceeded 520 million vehicles by 1999.[11] Figure 03 illustrates the underlying growth trend. Forecasts suggest that car numbers will double to 1 billion by 2010 and treble to 1.5 billion by 2035.

Fatal Accidents
The car's most extraordinary impact has been via accidents, 25 million people have died in car accidents in the 20th century — and many more have been injured.

2.0
What's the Problem?

03   Global Car Market 1965–2000 [12]

Millions of Cars
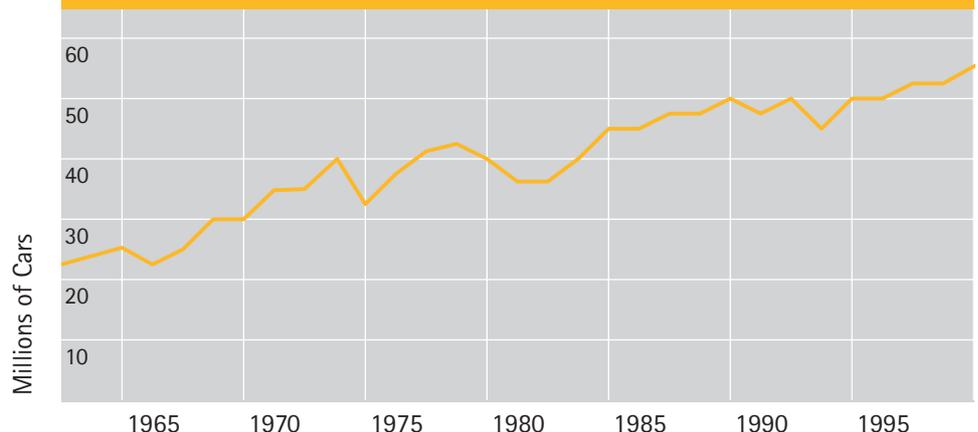
According to the World Bank, 1.17 million people die each year in road crashes, with 70% of the deaths occurring in less developed countries. Of all pedestrian deaths, 35% are children. A WHO study forecast that road crashes, which were the ninth most important health problem in 1990, will move to third place by 2020.[13]

Environmental Impacts

We tend to focus on the vehicles and ignore the infrastructure. But, to take just one example, think of the impacts associated with the 10,000 tonnes of aggregate needed for each kilometre of a two-lane highway.[14]

Greenhouse Effect and Air Quality

Cars collectively represent the largest single source of global air pollution, accounting for around 30% of industrialised country emissions and 17% of the emissions of carbon dioxide (CO_2), the main greenhouse gas. Focus down on the typical urban area, however, and road vehicles account for anywhere between 40% and 80% of total emissions.[15]

Cars Deter Other Modes

As automobility accelerates, so more sustainable modes — like walking and cycling — are actively and increasingly discouraged.

Price Tags

On the economic front, the costs of road congestion are huge: London alone is estimated to lose £19 billion a year as a result. A study by A&M University's Texas Transportation Institute of 68 US metropolitan areas found that traffic congestion is worsening everywhere.[16] The average person spent 11 hours in traffic jams in 1982, 34 hours in 1997, and 36 hours in 1999. In Los Angeles the figure is 56 hours. In the US, congestion is annually estimated to waste 6.8 billion gallons of fuel, add 4.5 billion hours of travel time and cost $78 billion.

Whose Definition?

The impacts and implications of automobility must be seen in the context of the wider 'sustainable mobility' challenge. So what do we mean by the term? The OECD has been working on environmentally sustainable transportation (EST) for a number of years, offering the following definition:

— '*An environmentally sustainable transport system is one that does not endanger public health or ecosystems and meets needs for access consistent with use of renewable resources below their rates of regeneration, and, use of non-renewable resources below the rates of development of renewable substitutes.*'[18]

Meanwhile, Canada's Center for Sustainable Transportation has also been working on a definition, but for sustainable transportation, so it is slightly wider:

— '*Allows the basic needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations.*
— *Is affordable, operates efficiently, offers a choice of transport mode, and supports a vibrant economy.*
— *Limits emissions and waste within the planet's ability to absorb them, minimises consumption of non-renewable resources, reuses and recycles its components, and minimises the use of land and the production of noise.*'[19]

For the purposes of *Driving Sustainability*, we are not offering a new definition. Instead, like Alexander the Great, we have taken four great transects through the whole ball of wool. These are:

'Like the tobacco companies before them, car companies have had their heads in the sand. They are about to get a rude awakening.'
Clarence Ditlow
Center for Auto Safety[20]

1 **Climate Change** (pages 13–16);
2 **Life Cycles** (pages 17–20);
3 **Liveable Cities** (pages 21–24); and
4 **Emerging Economies** (pages 25–28).

Whilst looking at company triple bottom line reporting on these issues, we also distinguish between three different levels of strategic response: technology-focused, behaviour-focused and system-focused (see Figure 04 on page 04).

For further discussion on sustainable mobility, including a number of projects exploring issues, trends and scenarios from the public sector and business and government perspectives, please refer to www.sustainability.com/mobility

'It could be said that by giving people the freedom to go wherever they want, the automobile has been one of the greatest assets created by 20th century civilisation. However, it has also had its drawbacks — running on limited fossil fuel resources and having an impact on the environment with its carbon dioxide and other emissions.'
Toyota Motor Corporation[17]

[11] Society of Motor Manufacturers and Traders, 2001, from various sources.
[12] UBS Warburg, Global Equity Research, *Environmentally Friendly Autos?*, November 2000.
[13] www.worldbank.org/html/fpd/transport/roads/safety.htm
[14] Michael Carley and Philippe Spapens, *Sharing the World*, Earthscan, 1998.
[15] Michael Carley and Philippe Spapens, op. cit.
[16] Scott Bowles, 'Traffic in more of a jam than ever', *USA Today*, 8 May 2001.
[17] Fujio Cho and Kousuke Shiramizu, Toyota, *Environmental Report*, 2000.
[18] Environmentally sustainable transport, www.oecd.org/env/trans
[19] The Center for Sustainable Transportation, *Definition and Vision of Sustainable Transportation*, Canada, September 1997.
[20] 'Consumers brace for car trouble', *The Guardian*, 31 August 2000.

Roles and Responsibilities

Once sustainable mobility problems and opportunities have been defined and the nature of the challenge understood, the obvious question arises: Who is responsible for developing solutions and implementing them? Reading the **Automobility–10**[21] reports, it comes across that companies are beginning to realise their responsibility:

— 'We aim to implement our vision of sustainable mobility via a systematic step-by-step approach. To this end, we are continually improving our products and seeking innovative solutions for intelligent drive and traffic concepts while maintaining a constructive dialogue with our partners, the political community and society as a whole. The automobile is only one element of our overall mobility strategy, which has been evolved to take due account of people's needs for mobility.' **BMW Group**[22]

— 'The notion of sustainable development forms a fundamental principle of our corporate culture. A company can only practise sustainable development if it is permanently aware of its social, economic and ecological dimensions and consequences of its corporate activities.' **Volkswagen**[23]

In evaluating the ten companies, we used a simple framework based on work by the Dutch electronics group, Philips (Figure 04). The point made here is that early stage adaptation by an industry, in this case the automotive sector, tends to focus on stretching existing *technologies* — and on developing new ones. This is the domain of what the World Business Council for Sustainable Development has dubbed 'eco-efficiency'.

Over time, however, the role and *behaviour* of key actors becomes increasingly important. This is where the function of a product or service is key. So instead of simply providing road transport, we might start to consider mobility solutions, followed by solutions designed to provide access to goods and services, without necessarily requiring high levels of transport or even mobility. This sort of thinking, which tends to emerge as it becomes clear that a paradigm shift is needed, focuses on *system*-level changes.

Views from the Bridge

Like ships' captains standing proudly on the bridges of their great vessels, the chief executive officers of major automotive companies should have an excellent view of the emerging agenda — and a good feel for their industry's likely responses. Within the *Engaging Stakeholders* program we have already taken a brief look at the CEOs' 'take' on the sustainability agenda,[25] but to what extent are they now taking a clear lead in addressing the sustainable mobility challenge? To what extent are they talking about the technological, behavioural and/or system-level challenges? And what sort of language are they using in doing so?
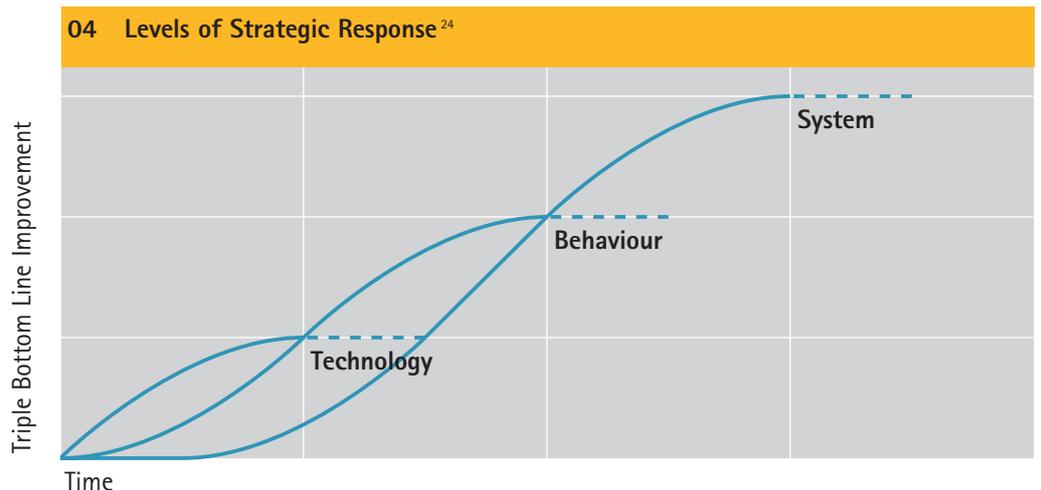
Of the ten reporting companies studied, **DaimlerChrysler**'s was the only environmental report that did not have a statement by the CEO or Chairman of the company. Ambitions for the future do feature in CEO statements. However on the basis of our simple litmus test, the minds of **Automobility–10** CEOs are still very much focused on incrementally improving technology:

PSA Peugeot Citroën

— 'The day when breakthrough technologies such as the fuel cell might power most automobiles in developed countries, let alone in the developing world, is getting closer. Our advancements and partnerships with business, government and non-governmental agencies will one day establish commercial viability for these technologies.' **GM**[26]

— 'Toyota will be able to provide technology to be widely used throughout society, and will be able to make substantial social contributions to the entire world through manufacturing automobiles.' **Toyota**[27]

2.1
Who's at
the Wheel?

04 Levels of Strategic Response[24]

Triple Bottom Line Improvement

System

Behaviour

Technology

Time

Who are the Visionaries?

There are radically different perspectives on who leads in the automotive sector, at least in terms of sustainable mobility. But, however the sector rankings are constructed and whoever ends up topping particular surveys, there is a growing appetite for visionary leadership and strategic innovation in the area of sustainable mobility. Addressing a sustainability session of the US Society of Automotive Engineers in 2000, Professor Tom Gladwin noted that: 'We need heroes who can really create the stretch visions, who can shape organizational purpose in harmony with sustainability.' [28]

When it comes to the rest of the world's views on who leads in automotive sector thinking on corporate citizenship and sustainable mobility, the name of **Ford** chairman Bill Ford routinely surfaces. So how does he see the sustainable mobility challenge? His family background gives him an unusual perspective, at least in terms of the time dimension.

When it comes to sustainability issues, he notes that 'the payoffs [are] 10, 20, 50 years down the line. I do believe that I'm building a stronger **Ford Motor Company** for my children and grandchildren.' But, he accepts, 'that's not a theme that resonates very well with most [financial] analysts.' [29]

But **Ford** — like other automotive companies — still churns out Sport Utility Vehicles (SUVs) as if its life depended on them (and, to a considerable degree, it does). Meanwhile, it has been dogged by the controversy surrounding the failure of Firestone tyres fitted to **Ford** *Explorer* SUVs.

Bill Ford isn't going to be a hero for **GM** or **VW**, so are there potential generic heroes for the industry? The answer is yes. Examples of 'out-of-the-box' thinkers would include Amory Lovins of the US Rocky Mountain Institute (RMI), champion of the 'hypercar', and Firoz Rasul, a veteran of fuel cell development at Ballard Power Systems in Canada. But little — or nothing — of these people's work pulls through into the reporting of the **Automobility–10**. The 'not-invented-here' syndrome at work?

Roles of Government

Governments tend to be highly protective of national automotive producers. Indeed, the automotive sector has been seen as a bellwether sector for the health of a modern industrial economy as a whole. A recent study by financial analysts Morgan Stanley Dean Witter found that the US automotive sector employs some five million people and accounts for 5-6% of the country's gross domestic product. In some US states, this proportion reaches as much as 20%. [31]

Not surprisingly, governments tend to view the automotive sector as the goose that lays the golden egg, with the result that their inclination to push for changes not seen to be in the direct interest of the industry is limited.

At the same time, the gradual weakening of government and the growing influence of business, and of global corporations in particular, is fuelling a shift in power relations. We often hear statistics such as: the total sales of the three largest auto-makers now exceed the gross national product (GNP) of the entire African continent. [32]

'In the future, companies will need to take an open and active role to create networks between markets, politics and society . . . with the scientific community, with innovators and with partners in the spheres of politics and society.'
BMW Group [33]

These may be real trends, but the evidence suggests that the Gordian Knot challenge of sustainable mobility will not be successfully addressed without an extremely energetic, strategic set of interventions and long-term vision from all levels of government. So what are these companies saying about the role of governments in shaping the transition to sustainable mobility systems? The answer, as yet, is very little. This is a subject we will return to later in this report.

'In more and more countries, ecologically-oriented parties and politicians are coming to share in government. The Agenda 21 debate is bringing ordinary people, representatives of NGOs and companies together at local level to look for a mutually acceptable route into the coming century.'
Volkswagen [30]

[21] BMW, DaimlerChrysler, Fiat, Ford, GM, Honda, PSA, Renault, Toyota and VW.
[22] Joachim Milberg, *BMW Group Environmental Report,* 1999/2000.
[23] Ferdinand Piëch, *Volkswagen Environmental Report,* 1999/2000.
[24] Adapted from diagram by Professor Ab Stevels of Philips Consumer Electronics, first published by Rathenau Institute, May 1996.
[25] *The CEO Agenda: Can business leaders satisfy the triple bottom line?,* SustainAbility for UNEP, 1998.
[26] Jack Smith, Chairman, Rick Wagoner, President and CEO, and Harry Pearce, Vice-Chairman, General Motors, *Steps Towards Sustainability,* 2000.
[27] Fujio Cho and Kousuke Shiramizu, Toyota, *Environmental Report,* 2000.
[28] www.sae.org
[29] Ford Motor Company, 'An Interview with the Chairman', *Connecting With Society,* 2000.
[30] Horst Minte, *Volkswagen Environmental Report,* 1999/2000.
[31] '2001 car sales may drop 10%', *Financial Times,* 15 March 2001.
[32] Sustainable Mobility, Industry and Environment, UNEP, Paris, October–December 2000.
[33] Joachim Milberg, *BMW Group Environmental Report,* 1999/2000.

Corporate Transparency

Whoever ends up shouldering the major responsibilities for delivering sustainable mobility solutions, growing levels of transparency will be required of all actors in the field. The problem is that, very often, surveys or policy projects on this subject end up mapping the various components of the Gordian Knot, but make little progress in terms of cutting through the complexity. So, for example, sustainable mobility has been investigated by a number of national and regional sustainable development initiatives:

— In the European Union, the European Commission and its EU Consultative Forum on Sustainable Development have both investigated the sustainable transport agenda, covering such issues as greenhouse gas emissions, end-of-life vehicles, car-free days and non-motorised transport. [34]

— On a global scale, **UNEP**'s Mobility Forum provides a platform for 12 major automotive manufacturers to share and promulgate best practices and new strategies for both mobility and environment. Also, to strengthen dialogue with various stakeholders, including on the development of sector-specific indicators for sustainability reporting. [35]

— In the USA, the now-defunct President's Council on Sustainable Development (PCSD) was set up to advise President Clinton on sustainable development issues, and also took a look at this area. [36]

— In the UK, the Sustainable Development Commission, which superseded the UK Roundtable on Sustainable Development, has attempted a definition of the sustainable transport sector. [37]

Also in the UK, the first automotive sector trade association to introduce a series of sustainable development reports, the Society of Motor Manufacturers and Traders (SMMT) announced a sustainability strategy for the UK automotive sector in 2000. [38] Unfortunately, the first report largely focused on environmental and social sustainability, perhaps taking economic sustainability for granted. Its publication almost coincided with the announcement of massive shutdowns of manufacturing operations by both **BMW** (as the then owner of Rover) and **Ford**.

Transparency and improved communication are not going to solve all this industry's problems. But, increasingly, transparency will become a necessary condition of business success:

— '. . . We must keep these partners informed about what we do on a regular basis, with open and transparent communications, maintaining an open dialogue at all times.'
BMW Group [39]

Why Come Clean?

Each of the **Automobility–10** companies has clearly decided to take the step of publicly reporting — at least to some degree — its corporate citizenship, environmental and/or sustainability commitments, targets and performance. In analysing these companies, we used a combination of reports (annual, corporate citizenship, environmental, sustainability) and websites. We also talked to a number of financial analysts tracking the sector. In terms of leadership, our analysis suggests that the following companies are pushing the envelope:

Annual Reports

Unusually, the **DaimlerChrysler** 1999 Annual Report provided substantial amounts of information about sustainable development, with sustainable mobility announced as the 'megatrend' for the new century. Unfortunately, their 2000 Annual Report then reverted to manufacturing — and significantly throttled back on sustainable mobility.

Stand-alone Triple Bottom Line Reports

The strongest example of a stand-alone report was **VW**, which achieved the highest automotive sector score among automotive sector companies in *The Global Reporters*. First-time reporter **PSA** also showed remarkable clarity on the issues facing the sector, focusing its report on four key problems — limiting the greenhouse effect, reconciling the car with city life, bringing industry and the environment into harmony, and recycling vehicles at the end of their useful life.

Websites

Of the **Automobility–10** websites, the most notable were **BMW**, **Ford** and **GM**. Both **Ford** and **GM** make their sustainability information accessible to users via the Internet. Specific features included **Ford**'s Envirodrive where customers can rate their vehicles in order to make informed decisions about the vehicles they drive, while **BMW** mentions its Institute for Mobility Research — where work in progress focuses, among other things, on intermodal traffic optimisation and mobility behaviour.

To help automotive sector companies work out how to report in future, we provide overall benchmark results on their current reporting on pages 10—11. We also outline possible areas of reporting in each section, aimed at improving the level of discussion of dilemmas and resulting performance.

2.2
Towards Total Transparency

'BMW aims to establish a future-oriented correlation between economy, ecology and society, to reduce environmental impact, to enhance the quality of life and to preserve individual mobility.'
BMW Group [40]

05 Automobility–10 Coverage of Sustainable Mobility (SM) in 1999–2000 Reports		
Coverage	**Manufacturer and Report**	**Understanding**
Spotlighting sustainable mobility	SM **BMW Group** *Environmental Report 1999/2000*	In both BMW's environmental report and sustainability brochure, SM is described as the triple bottom line of sustainable development and mobility: guaranteeing individual mobility, minimisation of environmental pollution and increasing quality of life. BMW's report encompasses integration of transport modes.
	PSA Peugeot Citroën *Environment & Automobiles 1999 Report*	Although PSA Peugeot Citroën does not mention SM specifically, most of the mobility issues that other companies discuss under this heading are dealt with in both its environmental and annual reports.
	SM **Volkswagen** *Environmental Report 1999/2000*	Although VW only briefly mentions SM, the company has a clear commitment to the triple bottom line. In their environmental report, they analyse the role of the car as an 'instrument of individual mobility' by means of the scenario approach.
Saying relatively little about sustainable mobility	SM **DaimlerChrysler** *Environmental Report 2000*	Although not further explained, SM is used in the R&D and technological context, especially in relation to fuel cell technology leadership.
	SM **Ford Motor Company** *Connecting with Society 1999 Corporate Citizenship Report*	SM is mentioned in Ford's corporate citizenship report as an 'opportunity space for products and services that are not auto-based'. Generally, however, Ford uses the term 'corporate citizenship' to describe issues of sustainable development.
	SM **General Motors** *Steps Towards Sustainability 1999/ 2000 Report on Economic, Environmental and Social Performance*	GM's report does not define SM, but lays out GM's understanding of SM as an overarching notion capturing the environmental and social impacts of mobility. GM mentions the WBCSD SM project, which aims to produce visions of future land transportation systems.
	SM **Renault** *Environmental Report 1999*	Renault's environmental report deals with the role of the car in the SM context, including a global mobility system based on intermodality.
Saying almost nothing about sustainable mobility	SM **Fiat** *2000 Environmental Report*	The environmental report presents commitment to the development of SM options, reflected in a series of projects and co-operations.
	Honda *Environmental Report 1999*	Does not mention SM.
	Toyota Motor Corporation *Environmental Report 2000*	Does not mention SM.
	SM *Report uses the term Sustainable Mobility*	

Talking SM

To test how far the sustainable mobility (SM) debate has penetrated the automotive sector, we carried out a content analysis of the **Automobility–10** reports. The results suggest a widely varying set of approaches and levels of understanding. Figure 05 summarises the coverage of sustainable mobility issues by these companies.
On the basis of their reporting, automotive companies that are strongly spotlighting the sustainable mobility debate, or at least the key issues, are the European companies **BMW**, **PSA** and **VW**. Companies that are saying relatively little are the US-based (or partly US-based) companies **DaimlerChrysler**, **Ford** and **GM**.
And companies that say little or nothing can be found in Europe, i.e. **Renault**, **Fiat**, and Japan, i.e. **Honda** and **Toyota**.

The only company to actually define its interpretation of sustainable mobility is **BMW**. However, **BMW**'s definition focuses on preserving individual mobility, and is therefore fundamentally different to the OECD and the Center for Sustainable Transportation's version which places the emphasis on equity within and between generations (page 03).

Levels 1, 2 or 3?

Stepping back a bit, we tested the extent to which the **Automobility–10** were viewing the challenges through Level 1 (Technology), Level 2 (Behaviour) or Level 3 (System) lenses. Not surprisingly, perhaps, it is technology dominated. Level 2 strategies or initiatives designed to change behaviour trailed a long way behind, and Level 3 system-focused thinking was weak to non-existent in most reporting and websites. Figure 06 maps the typical area of coverage.

Level 1: Technology

This is the area of highest excitement. Some companies may be betting the house on a narrow range of technologies, but most are spreading their bets. On the basis of the current crop of automotive sector reports, hybrid vehicles and fuel-cells are the hottest games in town. **Honda** and **Toyota** report their progress in bringing hybrid vehicles to market, for example, while **BMW** speaks of its 7-series car with a hydrogen-fuelled internal combustion engine.

Level 2: Behaviour

Automotive companies seem to find behavioural change something of an uphill struggle. Little or nothing is said about their role in influencing change, or about the psychological or sociological work that they do to understand — and capture — consumer priorities and motivations. That said, **PSA**, **Renault** and **VW** do have something to say in their reports on how consumers see the environmental challenges and issues, the first step to engaging and influencing choice.

Level 3: System

If coverage of the behavioural dimensions is weak, coverage of the necessary system-level changes for sustainable mobility is weaker still. That said, there are rare exceptions to the rule. **DaimlerChrysler**, for example, is beginning to move from the manufacturing perspective to a mobility perspective, as illustrated by its participation in a cross-sectoral project on the provision of inter-modal services in Berlin.

Emerging Strategies

Experience suggests that reports are rarely the best source of useful information on emergent corporate strategies. To get a real grip on this area of company thinking, it is necessary to interview key executives, something that financial analysts know well.

That said, the language used in reporting often — intentionally or not — points towards the strategic intention of the **Automobility–10**.[42]

— 'Ford Motor Company's vision is to become the world's leading consumer company that provides automotive products and services . . .'
Ford Motor Company

— 'GM's vision is to be the world leader in transportation products and related services.'
General Motors

The shift in thinking from transport to mobility has started in terms of language:

— 'Providing and maintaining worldwide mobility for increasing numbers of people in an environmentally compatible manner is one of the major challenges facing the BMW Group . . .'
BMW Group

— 'DaimlerChrysler is active in all modes of transportation and can therefore be truly described as a Mobility Group. With such diverse and yet related expertise united under one roof, thinking outside the box becomes second nature and opens up new possibilities for future mobility solutions . . .'
DaimlerChrysler

However, to date companies tend to focus on technology, rather than on behavioural or system-level changes:

— 'For the automotive industry, globalisation means above all technological competition . . . Beyond this, we are also confident that we will be able to assert our future-oriented concept of environmentally compatible mobility.'
BMW Group

✕ **Automobility–10** Reports

06   Coverage of 1999–2000 Reports[41]
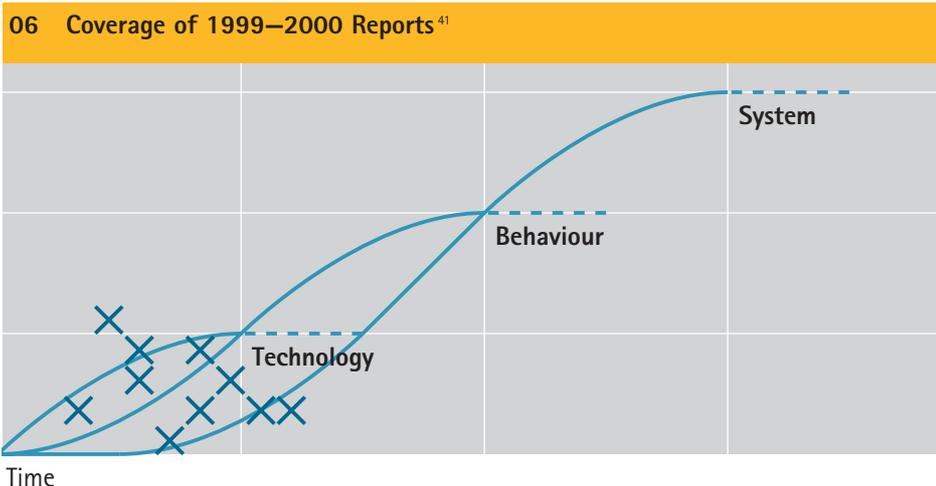
— 'A very high level of technical expertise and a passion for creating exceptional products mean that DaimlerChrysler will remain a driving force for innovative solutions which meet the mobility needs of the future.'
DaimlerChrysler

— 'Being in the automotive business, GM's future success is dependent on innovation in technology which will allow GM to achieve aggressive goals.'
General Motors

— 'Our objective is to develop cars whose appeal lies not only in their style, performance, safety and driving pleasure, but also in their environmental qualities.'
PSA Peugeot Citroën

— 'Forward thinking and technological innovation are central to our goal of ensuring that our customers enjoy the benefits of products which are not only safer and more economical, but will remain environmentally compatible throughout their lives.'
Renault

There are a number of early signals that new thinking is emerging:

— 'For a technology oriented group such as BMW, the term 'globalisation' first and foremost means the emergence of new markets and the intensification of worldwide, supra-regional trading relationships — on an economic, cultural and political level. At the same time however, globalisation of the world economy also entails the globalisation of social and ecological matters.'
BMW Group

— 'This transition from a traditional manufacturer to a 21st century consumer company is critical for our long-term financial success. It requires a new mindset — one focused on connecting not only with our customers, but with all our stakeholders — and new strategies to make it work.'
Ford Motor Company

— '. . . the company is working on the development of passenger and goods transport in its totality. This includes the design of new transport as a contribution to the development of more rational and more ecological solutions, since all transport media must be capable of co-existence and even interconnection . . . We are committed to the development of multimodality and complementarity between the car and public transport.'
Renault

The need for stakeholder engagement features strongly in many of these reports:

— 'An open and constructive dialogue with all the different environmental stakeholders will be of crucial importance in the timely development of shared solutions for these issues.'
Fiat

— 'We will invite stakeholders in to offer us their best thinking about the future of our markets, and how we could meet the needs of our customers and add value to society and the environment.'
Ford Motor Company

— 'GM enters into strategic alliances with various stakeholders for the purpose of developing or advocating positions and developing partnerships, which reflect its business and broader perspectives. GM supports these alliances through financial and in-kind resources.'
General Motors

Explicitly or implicitly, a small number of companies acknowledge the need for behavioural and cultural changes in pursuit of sustainable mobility:

— 'In our effort to achieve the continuous improvement of our environmental performance, we involved not only our manufacturing partners, but also local institutions — through special projects on mobility and safety, and the educational system — through programs designed to encourage a responsible utilisation of means of transport.'
Fiat

— 'Our shared vision — and my sincere hope — is that Ford can become a company whose decisions and choices restore the environment and contribute to the creation of social and economic equity in communities around the world.'
Ford Motor Company

Another area of growing activity is the formation of strategic alliances. **BMW** has this to say about its strategy, focusing on:

— 'New alliances for global activity. Co-operation between companies, governments and non-governmental organisations. Companies need visions if they want to play a part in shaping the future. International political and financial institutions such as the United Nations, the World Bank and the International Monetary Fund are all in agreement that, in an era of globalisation, no participant can be expected to realise visions by themselves. Business, society and politics are facing communal challenges.'
BMW Group [43]

Those were the words, but how is all of this translating into actions?

'As we at VW move beyond the mere production of motor vehicles to tackle mobility issues, there is an increasing need for co-operation on a global, cross-sectoral basis — and this requires a quantum leap in terms of vision and innovation.'
Volkswagen

[34] www.europa.eu.int/comm/environment/forum
[35] www.unepie.org
[36] http://clinton2.nara.gov/PCSD
[37] www.sd-commission.gov.uk
[38] www.smmt.co.uk
[39] Joachim Milberg, *BMW Group Environmental Report*, 1999/2000.
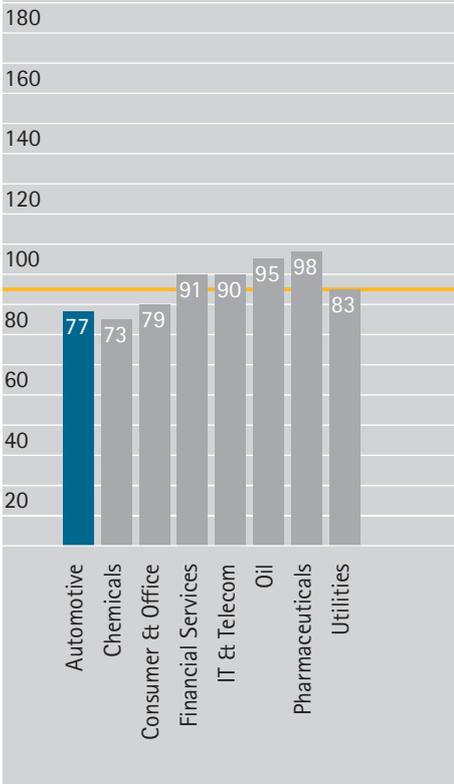[40] *BMW Group Environmental Report*, 1999/2000.
[41] Adapted from a diagram by Professor ALN Stevels of Philips Consumer Electronics, first published by the Rathenau Institute, May 1996.
[42] Comments taken from the range of environmental and sustainability reports of each company, outlined on page 07.
[43] BMW Group, *Taking Responsibility*, 2000.

07 Global Reporters Sector Scores

pts Maximum Possible Score 196 pts
Average Score 84 pts

Automotive 77
Chemicals 73
Consumer & Office 79
Financial Services 91
IT & Telecom 90
Oil 95
Pharmaceuticals 98
Utilities 83

[44] www.sam-group.com
www.sustainability-index.com
www.oekom.de
[45] www.innovestgroup.com
[46] http://environmental-finance.
webserver.org/envfin/featdec2_2.htm

2.3 Benchmark Survey

Auto Sector Benchmarks

So how do the **Automobility–10** stack up? It's not easy to say. When they score well, automotive companies — like other companies — are happy to report the results of external benchmark surveys. To illustrate the point, both **BMW** and **VW** reference their leading positions in ratings published by SAM, part of the Dow Jones Sustainability Group (DJSGI) — and even reproduce the relevant diagram (Figure 08). Others — some covered by SAM, some not — remain silent on the subject of external benchmarking. But nowhere is the Gordian Knot nature of the sustainable mobility agenda clearer than in the results of the different automotive sector studies. For example:

— **BMW** is identified as a sector leader by the SAM and Ökom surveys. [44]
— **DaimlerChrysler** leads in the *Driving Sustainability* survey (see Executive Summary) and the SAM survey.
— **Toyota** has been identified as a leader in Innovest's EcoValue rating. [45]
— **VW** emerged as the automotive sector leader in SustainAbility's *Global Reporters* survey, *Environmental Finance* magazine's 2000–01 survey and the SAM survey. [46]

Part of this variation in benchmarking scores presumably results from the fact that different aspects of company reputation, commitment and performance are being measured. Part of the variation must also reflect the sheer variety of assessment methodologies used and different definitions of sustainable mobility. And part of the divergence, too, could flow from different timings of the analyses. To be clear, **SustainAbility'**s benchmarking focuses not on performance but on different dimensions of corporate reporting and communication.

Global Reporters, Automobility–10 Scores

Before looking at the **Automobility–10** reports in more detail in Section 3, it is worth noting how the automotive sector fared in the 2000 *Global Reporters* benchmark survey of corporate sustainability reporting. Five companies were originally benchmarked (**BMW, Ford, GM, Toyota, VW**) and Figure 07 shows how the automotive sector ranked against the seven other sectors covered in *Global Reporters*, while Figure 10 provides a breakdown of the **Automobility–10** scores.

The original score for the automotive sector (77 points out of a potential total of 196, or 39%) positioned it towards the bottom end of the spectrum, with the lead being provided by the pharmaceuticals (98 points) and oil & gas (95 points) sectors. When the five companies included in the **Automobility–10** sample (Figure 09) were added, the average sector score fell from 77 to 63 points, representing just 32% of the potential maximum score.

VW (95 points) emerged in the lead in the **Automobility–10** benchmarking, followed by **Ford** (82 points) and **GM** (81 points). The lowest scores went to **Renault** (36 points) and **Fiat** (35 points). These results, however, only tell us part of the story. They reflect quality of sustainability reporting, and whilst a proxy for performance, may not always reflect true intention to move towards sustainable mobility. To get a different perspective, and a better sense of the relative interest and value of the different styles of reporting, we need to focus on specific issues. This we do in Section 3 with an additional benchmark of each key sustainable mobility issue.

As automotive companies release new reports, the latest benchmarking scores will be featured on the **SustainAbility** website: www.sustainability.com/mobility

✕ DJSGI Members   ✕ Non-Members

08 SAM Rating of Auto Companies [44]

Management of Sustainability Opportunity

	Poor		Average		Best	
High					✕	✕ Volkswagen
					✕	✕ BMW / ✕ DaimlerChrysler
Average						
		✕	✕			
Low						

Management of Sustainability Risk

09 Automobility–10 Reporting Scores

pts Maximum Possible Score 196 points
Average Score 62 points

Company	Score
BMW Group	71
DaimlerChrysler	58
Fiat	35
Ford Motor Company	82
General Motors	81
Honda	62
PSA Peugeot Citroën	43
Renault	36
Toyota	66
Volkswagen	95

10.1 Automobility–10 Breakdowns

% Management Quality Dimension

Company	%
BMW Group	39
DaimlerChrysler	46
Fiat	21
Ford Motor Company	43
General Motors	43
Honda	32
PSA Peugeot Citroën	29
Renault	21
Toyota	43
Volkswagen	46

10.2 Automobility–10 Breakdowns

% Economic Dimension

Company	%
BMW Group	21
DaimlerChrysler	25
Fiat	7
Ford Motor Company	32
General Motors	36
Honda	25
PSA Peugeot Citroën	7
Renault	11
Toyota	29
Volkswagen	21

10.3 Automobility–10 Breakdowns

% Social & Ethical Dimension

Company	%
BMW Group	14
DaimlerChrysler	4
Fiat	
Ford Motor Company	29
General Motors	46
Honda	18
PSA Peugeot Citroën	
Renault	7
Toyota	14
Volkswagen	25

10.4 Automobility–10 Breakdowns

% Environmental Dimension

Company	%
BMW Group	56
DaimlerChrysler	40
Fiat	25
Ford Motor Company	50
General Motors	50
Honda	56
PSA Peugeot Citroën	41
Renault	31
Toyota	53
Volkswagen	62

10.5 Automobility–10 Breakdowns

% Multi-dimensional Dimension

Company	%
BMW Group	50
DaimlerChrysler	25
Fiat	17
Ford Motor Company	42
General Motors	42
Honda	42
PSA Peugeot Citroën	42
Renault	17
Toyota	42
Volkswagen	58

Key Issues

To manage the Gordian Knot of sustainable mobility, we have tried to slice it into manageable pieces. For the present purposes, we will look at the challenge in four dimensions:

Climate Change

This is probably the biggest single factor potentially influencing the future of automotive manufacturers. We touch on the global energy debate, the need for the radical decarbonisation of the sector's energy sources and the question of vehicle numbers.

Life Cycles

Life cycle management is perceived as a major headache, with 'take-back' regulations raising the temperature of the debate in the EU. The need for significant reductions in material throughputs in the global automotive manufacturing system is increasingly evident, as is the need for the establishment of closed loop systems. This issue is linked to vehicle ownership and to liabilities, up and down the value chain.

Liveable Cities

The liveable cities nexus is perhaps the most difficult aspect of the Gordian Knot to define, not least because it has a great deal to do with behaviour. This cluster of issues links to direct social and environmental impacts, as well as to indirect impacts such as congestion, the severance of communities, the fragmentation of habitats, and urban sprawl.

Emerging Economies

The final issue relates to the development of sustainable mobility patterns in the emerging economies. Questions here link to how companies approach new markets, adapting their current business models or devising new models to deal with the very different needs and problems in the relevant markets. Their role in aiding the sustainable development of these economies is key, bringing in wider responsibilities incurred in operating in countries where standards, regulations and cultural expectations are different.

What's their Big Idea?

For each sustainable mobility issue, we use the three levels of strategic response (Figure 11) as a framework for analysis. The most interesting of the temporal perspectives is the future, hence we concentrate on what 'Big Ideas' the **Automobility–10** convey in their reports, related to each issue.
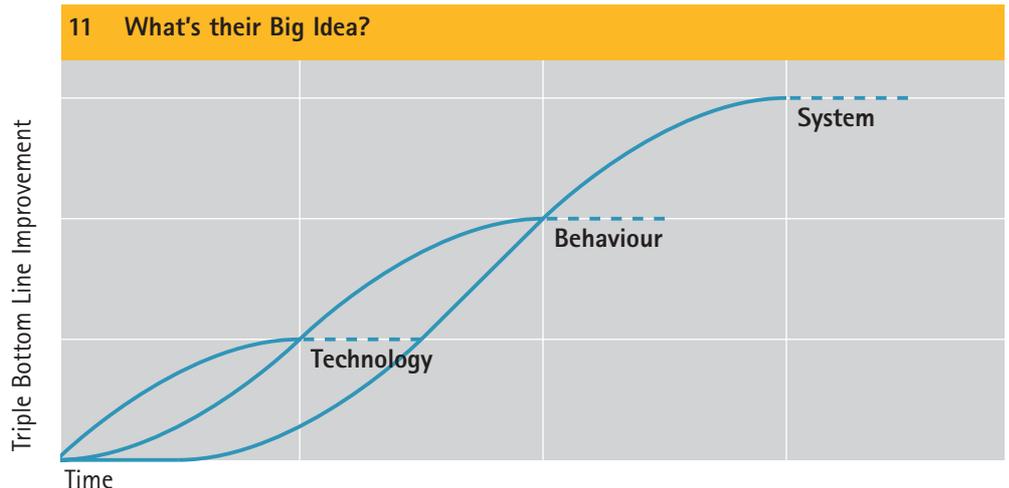
The Issues Benchmark

As part of the analysis, the **Automobility–10** companies have been benchmarked on their publicly available information relevant to each of the four main issues. This information was collected from a combination of environmental, social and/or corporate citizenship reports (see Figure 05, page 07 for list of reports), and from company websites (specifically, data accessible in 20 minutes from the start of the search).

The benchmarks were devised using our **UNEP/SustainAbility** *The Global Reporters* benchmark methodology as a starting point.[47] Each issue was rated in terms of a 1—5 score, with a score of 0 representing no mention of the particular issue and a score of 5 representing state-of-the-art coverage. The scores have been tabulated and the results compared for each issue. Current practice from companies is discussed in the text of the relevant sections.

[47] *The Global Reporters: The first international benchmark survey of corporate sustainability reporting,* SustainAbility for UNEP, 2000.

3.0 Sustainable Mobility

11   **What's their Big Idea?**

Triple Bottom Line Improvement

System

Behaviour

Technology

Time

What's the Problem?

Automobile production is now one of the largest manufacturing activities on earth. Motor vehicles consume half the world's oil — and car tailpipe fumes represent the biggest source — by far — of air pollution in half the world's cities. [48] Although in the past the focus has been on pollutants like nitrogen oxides and lead, attention is increasingly focusing on the carbon dioxide component of these emissions.

The reason why is not hard to find. A recent report from the Intergovernmental Panel on Climate Change (IPCC), an eminent body of scientists advising governments on global warming, spotlights the potential losers from climate change over the next century. The impacts will not be equitably distributed. For example, the world's poorest are expected to suffer heavier floods, worse droughts, failing agriculture and increased incidence of disease. [49]

Following years of industry denial of the mounting evidence, as illustrated by the activities of the Global Climate Coalition (GCC), an alliance of major energy users, there seems to be an emerging commonality of vision between a number of energy and automotive companies. Whilst vast reserves of oil are still in existence, they are beginning to accept that scarcity of the resource is not the real worry. Climate change is. Even ExxonMobil, whilst publicly scoffing about global warming, 'are quietly investing huge sums in carbon-related technology.' [50]

Despite the early anti-Kyoto announcements by US President, George W Bush, it is clear that climate change is now firmly on the global governance agenda. [51] Future talks are likely to lead to energy taxes, the removal of subsidies, and the introduction of economic instruments to ensure that prices reflect environmental and social impacts.

There is even some evidence that implementing the Kyoto treaty could be achieved with net benefits in economic terms, to the extent that the US economy might be $200 billion better off if it followed a strategy of investment-led productivity growth for mitigating climate change.' [52]

When faced with the possible replication of current rich-world energy and transport systems and infrastructure in emerging and developing economies, the likely significance of climate change grows exponentially.

The range of impacts caused is indicated by the following statistics. North America has the highest levels per capita of CO_2 emissions in the world, a direct contributor to global warming, with 19.8 tons in 1995 — compared to emissions of 12 tons in Germany, 9 tons in Japan and 2.6 tons in China.' [53] If the world follows the USA and takes to the roads in SUVs, we will risk leaving any hopes of sustainable mobility behind in our dust-clouds.

PSA Peugeot Citroën

3.1 Climate Change

BMW

Is it on Corporate Radar Screens?

Since the US automotive manufacturers **Ford** and **GM** pulled out of the Global Climate Coalition in 1999 and 2000 respectively, climate change has firmly taken centre stage for many companies. 'Asked about their biggest worry for the future, most industry bosses will say greenery,' *The Economist* has noted. 'At the global level, their main headache is climate change.'[54] How multinational companies will now react to the evolving climate change talks is still unclear, but — on the evidence of the **Automobility–10** reports — there is little doubt in the minds of at least the European and Japanese automotive manufacturers that the issue needs to be addressed.

What's their Big Idea?

Reading the **Automobility–10** reports, it is clear that there is at least one basic assumption common to all — the future of mobility will involve an extension of business as usual, with road transport and privately owned cars and other vehicles as the main way forward. Once this assumption is made, and assuming that the climate change challenge becomes more urgent, then the main technology response — the 'Big Idea' — is seen to be the fuel cell. The main system-level change, in turn, is seen to be a shift to the hydrogen economy. Very little is said, however, about how the necessary infrastructure will be provided and paid for, or about the sound production of hydrogen.

On the basis of these automotive sector reports, it is becoming accepted industry wisdom that the fuel cell is the key technology of the future. The evidence is most striking in the growing number of partnerships between companies, designed to share innovation and technology. Such partnerships include those formed by:

— **DaimlerChrysler**, **Ford** and Ballard Power;
— ExxonMobil, **Toyota** and **GM**, where the focus is on fuel cells for vehicles; and,
— **DaimlerChrysler** which has joined forces with Shell Hydrogen, Norsk Hydro and Vistorka HF (an Icelandic consortium) to investigate the possibility of creating the world's first 'hydrogen economy' in Iceland.[55]

Interestingly, fuel cell technology is not new. Indeed, it has been in existence for more than 150 years. The main barrier to its wider deployment has been — and continues to be — cost. Today, fuel cells cost around $140 per kilowatt. They would only become cost-competitive with conventional engines if the costs fell to less than $50 per kilowatt.[56]

Ferdinand Panik of **DaimlerChrysler**'s fuel cell project group explains: 'We have overcome the main technological obstacles facing the development of the fuel cell drive system. The task now is to reduce its costs and pave the way (e.g. infrastructure) for rapid introduction of these automobiles by 2004.'[57]

For most companies, the time-scales are seen as likely to be significantly longer. An interim solution has been to develop hybrid vehicles, with **Honda** and **Toyota** placing their early models on the market over the last year or two.

The US automakers **Ford** and **GM** also plan to launch electrically assisted gasoline engine vehicles, offering hybrid options on most models, although on current evidence this may take a decade or more.[58]

Working on the assumption that the hydrogen economy will take many years to evolve, **VW** recently announced its plans to produce a 20 horsepower, 400 kilogram car which uses only one litre of fuel per 100 kilometres, representing a major breakthrough in eco-efficiency.[59]
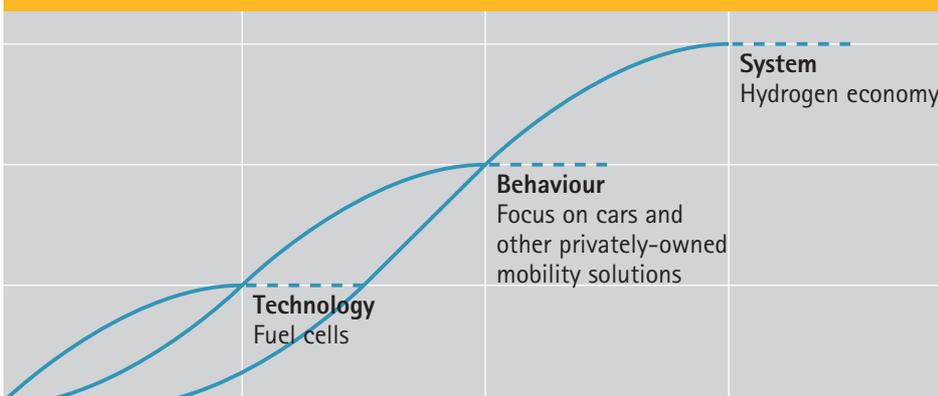
Most companies, meanwhile, continue to spread their bets. **Toyota**, for example, is among those focusing on fuel cells, announcing its latest innovation at the International Symposium on Fuel Cell Vehicles in March 2001: the FCHV-3, a fuel cell hybrid. This is part of their research into an array of fuel sources, although they still believe hydrogen will be mainstay fuel of the future. **Honda** remains the most ambitious with its launch date of 2003 for the fuel cell car.

Given automotive companies' love of technology and their engineering skills, it is hardly surprising that this is their focus in developing responses to climate change. But very few of the **Automobility–10** currently make any mention of the Level 2 (Behaviour) and Level 3 (System) changes that will be needed in future. Instead, they all assume an upward trajectory in private, road-based mobility.

One small example of a company that is trying to deal with the implicit climate change challenge is **PSA** — through spotlighting potential carbon offset schemes that might conceivably help to sponge up some of the emissions.[60]

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12   Climate Change: What's their Big Idea?

Triple Bottom Line Improvement

System
Hydrogen economy

Behaviour
Focus on cars and other privately-owned mobility solutions

Technology
Fuel cells

Time

What's Missing?

Whilst the manufacturers and their respective alliances are racing to promote standardisation of their technology, the focus on affecting consumer behaviour and system-level change is lacking.

The biggest piece of the puzzle is missing — the growing number of vehicles on the road means that incrementally improving fuel efficiency, or in fact changing fuel technology, is unlikely to address climate change. Until consumer behaviour is influenced, and companies think about their climate change impact holistically, the necessary levels of improvement will not be achieved.

In addition, a need to build infrastructure to support the change in fuels is another case in point for alternatives and their take-up. 'Over the near and medium term, hybrids may be the most feasible technology, as it uses current gas station infrastructure. Alternative fuels will require new infrastructure, which may be one of the larger obstacles to replacing fossil fueled propulsion.' [61]
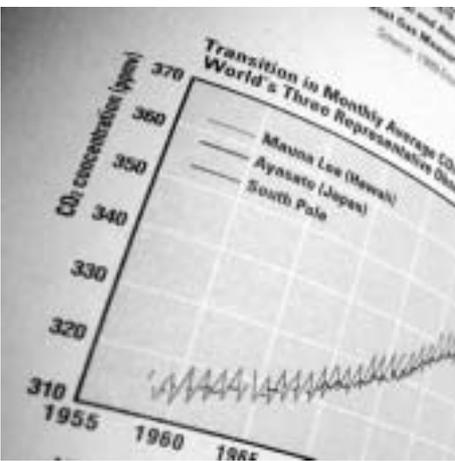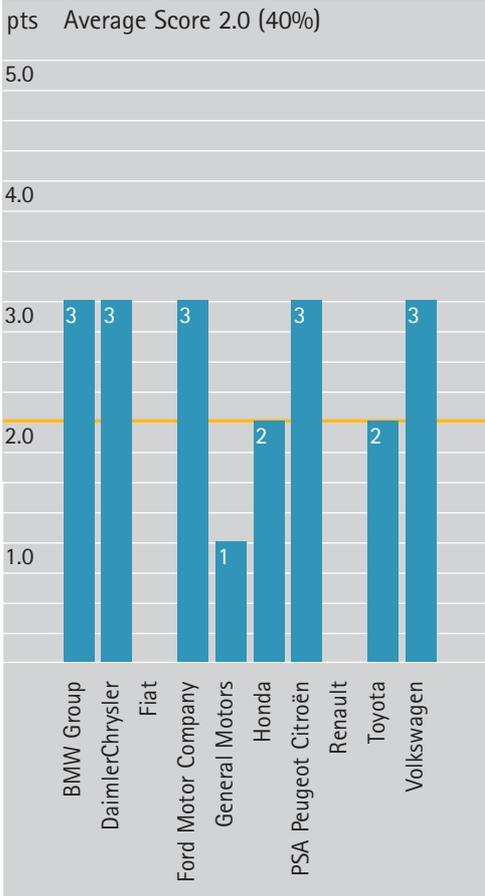
Climate Change: Issues Benchmark

Our 2001 climate change reporting benchmark survey has assessed the ways in which an automotive company tries to define the climate change challenge — and then communicates its climate change vision, strategies, plans and performance. The information was scored on the basis of how well each company demonstrates the link between climate change and its activities, together with the way it describes its relevant portfolio of strategies, products and initiatives.

The climate change issue is where we have seen most progress so far. In terms of technological achievement, the Japanese have been pushing hard with their hybrid and fuel cells. However, the Europeans are leading overall in the area of climate change through their open discussion of the issue, their integration into strategy and their visionary level of understanding.

The scores suggest that no single company currently leads in this area. In fact, our benchmarking suggests that a cluster of companies share the lead: **BMW**, **DaimlerChrysler**, **Ford**, **PSA** and **VW**. They are open about the dilemmas, they show first signs of trying to improve performance in this area and are aware of their impacts.

That said, the companies managing a score of 3 (out of 5) are all at an early stage in the game. None of them, for example, is yet reporting along the lines proposed in ongoing work between the World Resources Institute (WRI) and the World Business Council for Sustainable Development, although **Ford** and **VW** have been involved in the piloting of the greenhouse gas (GHG) reporting protocol. [63]

Honda [62]

13　Climate Change: Issues Scores

pts　Average Score 2.0 (40%)

Company	Score
BMW Group	3
DaimlerChrysler	3
Fiat	
Ford Motor Company	3
General Motors	1
Honda	2
PSA Peugeot Citroën	3
Renault	
Toyota	2
Volkswagen	3

Where will Reporting be in 2003–5?

Companies are beginning to realise that performance in relation to climate change will be pivotal to their long-term futures. Reporting on the issue is still mostly limited to technology, hence the following suggestions which give a flavour of the type of information companies will be expected to report on in future.

48 J Motavilli and A Spencer-Cooke, 'The Road Ahead', *Tomorrow*, Sept/Oct 2000.
49 M McCarthy, 'UN delivers apocalyptic warning on climate', *The Independent*, 20 February 2001.
50 'Will the Oil Run Out?', *The Economist*, 10 February 2001.
51 www.unfccc.de
52 F Krause, *Solving the Kyoto Quandary: Flexibility with No Regrets*, International Project for Sustainable Energy Paths, 2000, www.ipsep.org
53 *Rachel's Environment and Health Weekly*, No.522, 28 November 1996.
54 'Will the Oil Run Out?', *The Economist*, 10 February 2001.
55 www.shell.com March 2001.
56 'Ulterior Motors: Economics of Fuel-Cell Cars', *The New York Times Magazine*, 10 December 2000.
57 www.sustainablebusiness.com
58 'Detroit's Answer to 'Hybrid' Cars', *The New York Times*, 20 February 2001.
59 www.autohaus-online.de October 2000.
60 Peugeot, *Environment and Automobiles*, 1999.
61 *Japan Auto Inc — The world that is changing the machine*, Lehman Brothers, February 2000.
62 Honda Ecology, *Honda Environmental Conservation Activities*, 1999.
63 www.ghgprotocol.org

Climate Change: Technology

For the reporting auto companies, technology is generally the starting point. This is what they do best. One problem with cleaning up the world's car fleet, however, has been that they can bring energy penalties, denting energy efficiency and boosting climate impacts. Over time, however, auto sector innovation will embrace and achieve multiple objectives. Among the areas we would like to see reporting cover by 2003—5 are:

— Percentage of zero and low emission vehicles sold per fleet;
— Manufacturing and fleet emissions and impacts relative to national and global greenhouse gas emissions;
— Degree of decarbonisation achieved across the company's portfolio, together with performance against industry benchmarks and future targets;
— Barriers to change.

Climate Change: Behaviour

The surveyed companies generally have less to say on the behavioural front, either in respect of their own behaviour or their efforts to influence consumer behaviour towards sustainability objectives. Among the areas we would like to see reporting cover by 2003—5 are:

— Public and customer poll data on climate change priorities;
— Development of carbon offsets to reduce climate impacts both of company activities and of fleet as a whole;
— Efforts to make carbon neutrality a competitive issue;
— Advice to customers and motorists on climate-friendly options and behaviour;
— Use of advertising and marketing;
— Response of customers and media to climate-friendly offers;
— Barriers to change.

Climate Change: System

The toughest challenge of all will be to change transport, mobility and access systems. Among the areas we would like to see reporting cover by 2003—5 are:

— Lobbying by individual company – and by wider coalitions – in support of climate-friendly transport and mobility systems;
— Involvement in (and experience of) carbon emissions trading;
— Progress in creating markets for renewable energy in auto sector;
— Benchmarking of performance not only against best of class in the auto sector, but best of class in the mobility sector;
— Barriers to change

What's the Problem?

The old industrial model was that automotive companies bought materials on commodity markets, formed them into vehicles, sold them to customers and then, apart from service and components activities, waved goodbye both to the vehicles and (to a considerable degree) any linked liabilities. No longer. Over time, a range of liabilities have reshaped the way the automotive sector thinks about product life cycles and the related responsibilities. Now the growing focus on 'end-of-life' vehicles (ELV) is helping to force an even more radical rethink.

The key to future success, leading companies are concluding, will be life cycle management. 'Extended producer responsibility' is not a new concept, with recent years having seen growing efforts in such areas as health and safety and total quality, but the linked concept of 'extended product responsibility' powerfully reframes the value chain discussion. The value chain extends through from the mining and processing of raw materials to the disposal of vehicles at the end of their useful lives. The scale of the resulting disposal problems is indicated by the fact that in the European Union alone, somewhere between 9 and 13 million vehicles are discarded each year. [64]

There have been long-standing debates about how to deal with the resulting scrap. Metals can be fairly readily recycled, but the growing use of polymers and other materials in vehicles has caused complications. For example, it might make sense to burn some of the combustible wastes, but they are often contaminated by toxins, and there is widespread resistance to new incineration facilities.

Considerable progress has been made in material recovery, re-use and recycling, although much of that activity is in the hands of the commercial 'shredders', rather than falling to the automotive companies directly. Increasingly, however, these companies are being pulled into the debate — and asked to take a much greater degree of responsibility for ELV vehicles.

More ELV recycling happens than many people might assume. Currently, some 75—85% of the weight of EU cars is recycled. But this is far from the whole picture: up to 25% of each discarded vehicle's weight is considered hazardous, potentially contaminating landfill soil and groundwater.

Even so, the automotive industry has had real problems with this first step on the path to embracing a life cycle management approach. One obvious reason: the financial implications of the EU's recent ELV directive, due to come into force in 2007, are considerable. At the same time, this is an early warning signal of similar pressures that the industry in other world regions will need to take on board in future.

German auto-makers led a campaign against the new provisions, but are increasingly accepting this as the way of the future. **VW**, for example, is planning to set aside about DM1 billion (£330 million) to ensure it complies with the directive, to be taken against **VW**'s 2000 results. [65] Industry analysts estimate the cost per vehicle at some € 180 (£115), which with some 12 million cars being scrapped each year in Europe would suggest an overall annual cost to the industry of more than € 2.1 billion.

Is it on Corporate Radar Screens?

Yes, for most of these companies the life cycle challenge is both real and being worked on, often to some considerable degree. This is an area where there have been a growing number of inter-sectoral alliances, linking auto-makers and materials suppliers. The end-of-life pressures are helping drive the process.

That said, the ways in which different companies handle the issue in their reporting vary considerably. Some, like **Toyota**, give a fair amount of space to life-cycle analysis or assessment (LCA) early on in their report, while others give it a much lower profile. To date, reporting companies are much more likely to use LCA tools to manage materials, energy and manufacturing processes than they are to review and remould their business models. The best explanation of the life cycle management (LCM) challenge we came across is from **VW**:

— 'Some of the key areas we all need to rethink include designing cars that are easier to dismantle, selecting appropriate materials and using secondary raw materials. Anyone who, like our suppliers, is involved in the creation of more than 60 percent of a car's added value must join forces with the manufacturer to share in the responsibility for responding to new ELV recycling issues and obtaining type approval for new models. This is a major new challenge that can only be compared to the introduction of catalytic converters in response to emissions limits.'
Volkswagen [66]

3.2
Life Cycles
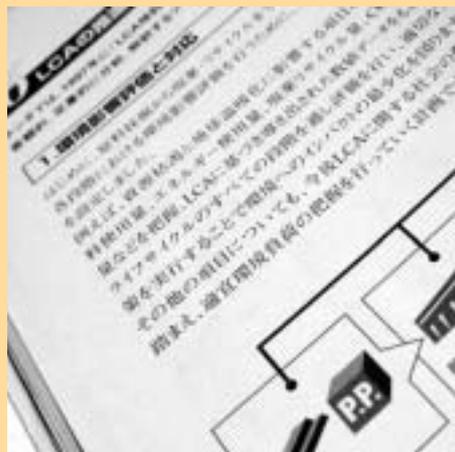
Honda
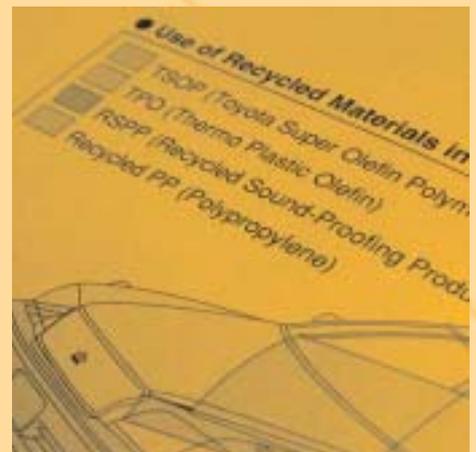
Toyota

What's their Big Idea?

If the automotive industry sees fuel cells and the hydrogen economy as the 'Holy Grail' in the area of pollution clean-up and climate change, what is the equivalent in terms of life cycle management?

As Figure 14 suggests, and despite the lobbying efforts of the industry to slow or reverse the ELV directive in Europe, long-term thinkers in the industry see the emerging 'Big Idea' as focusing on closing the loop. This will likely involve an inevitable trend (albeit at different speeds in different countries and world regions) towards regulated take-back requirements, closed loop systems, design-for-recycling, and the viewing of automotive materials and components as 'technical nutrients'. [67] On the basis of the reports under review, some of the priority areas for future action include:

Growing Use of LCA Techniques
LCA has become something of a universal language in the industry when it comes to describing its environmental initiatives, but some companies are more fluent than others. Most companies still introduce LCA in a largely anecdotal way, rather than using it as a framework for their reporting. **Toyota**, to take just one example, reports on the results of a comparative LCA between the emissions from an electric vehicle *RAV4 EV* and its new hybrid vehicle, the *Prius*. The focus, in short, is still on individual materials, products or processes, rather than on mobility options and systems.

Recyclability, Dematerialisation and Detoxification
LCA can help inform recycling and renewable materials initiatives. **DaimlerChrysler** has been conducting research into the use of alternative, renewable materials for car components, investing in sisal farms in South Africa. But increasingly the focus will not simply be on making individual vehicles lighter, more fuel-efficient or even 'renewable'. It will also be on the dematerialisation and detoxification of entire transport and mobility systems.

Zero Emissions and Waste Targets
These take the challenge a stage further. Honda was recently the first automotive company to achieve zero landfill waste at all its Japanese plants, a significant achievement in efficiency. **DaimlerChrysler's** construction of its Toluca wastewater treatment facility in Mexico, where the aim is to recycle all water, resulting in no discharge outside the complex, is another example of this push towards zero.

Integrated Supply Chains
There are many reasons for integrating supply chains, including cost reduction and total quality management. **GM's** new plant in Brazil, where component suppliers sit next to paint manufacturers and vehicle assemblers, represents an innovation in supply chain relationships. [68] A number of reporting companies mention initiatives designed to develop and use LCA frameworks to ensure that environmental performance improvements cascade through the chain.

Life Cycle Management Strategies
As the regulatory and market pressures intensify, companies are beginning to integrate life cycle thinking into their strategies. **PSA** talks of its 3-part strategy:
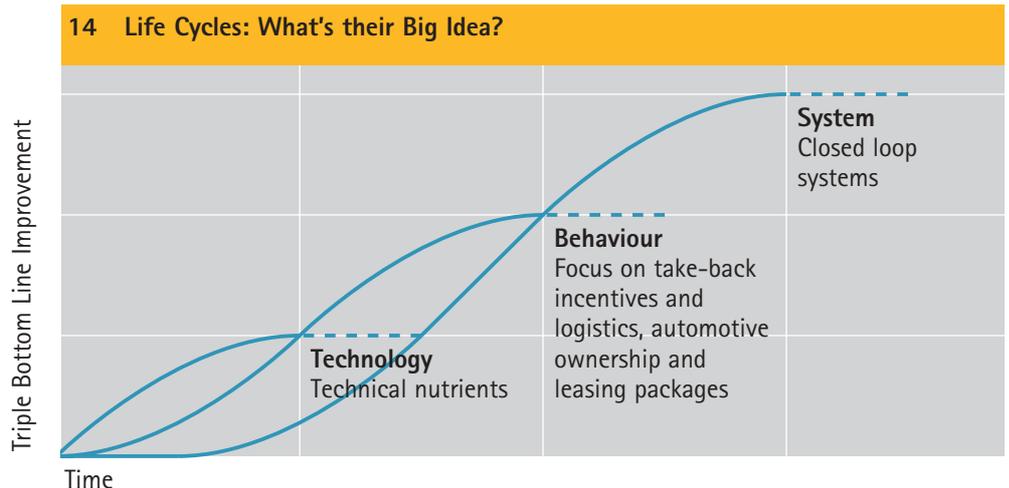
1 To design and manufacture vehicles that will be 90% recyclable from 2002 onwards, by integrating recyclability requirements from the design stage;
2 To work with the Relais Vert Auto network of 'clean garages' across Europe to accept and recycle automotive waste received from the public; and
3 To build its Secoia programme, designed to promote the re-use of parts.

Infrastructure Investments
To accompany the launch of the *Prius* in Europe, **Toyota** announced plans to open a dedicated network of dealers and recycling centres to handle the requirements of the EU ELV directive. This will include 80 'hybrid technical centres' in the UK that will also take responsibility for the process and cost of recycling the vehicle's batteries. [69]
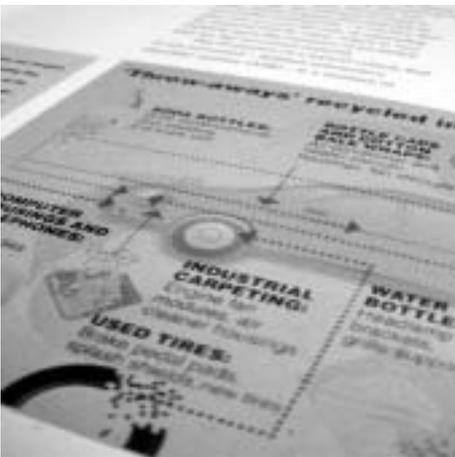
Acquisitions
As life-cycle and ELV issues become more important, expect to see cross-industry mergers and acquisitions. So, for example, **Ford** began to move into vehicle dismantling in the US during 2000, with its first site in Tampa disassembling cars and commercial vehicles for parts, as well as collecting from other **Ford** plants for recycling. **Ford's** purchase of Kwik-Fit, the largest independent fast fit repair chain in Europe, was seen as supporting its strategy to sell the re-conditioned parts to body shops, insurance companies and directly to the public via the internet. 'We see this as potentially a billion dollar or more business,' explained **Ford** CEO Jacques Nasser.

14 Life Cycles: What's their Big Idea?

Triple Bottom Line Improvement

Technology
Technical nutrients

Behaviour
Focus on take-back incentives and logistics, automotive ownership and leasing packages

System
Closed loop systems

Time

What's Missing?

Manufacturers still think in terms of how to improve the technology at each incremental stage of product design. End-of-life is only the end piece of a complex puzzle. Until companies begin to think about the full length and breadth of their value chain — including how to connect the strands together and understand their product within the system — they are unlikely to achieve more than incremental change. Once teams with perspectives over the whole life cycle come together, creativity around function, design, materials sourcing and use can provide new angles on the product. This connectedness is what still fails to appear in discussions around company performance and impact in the wider community.
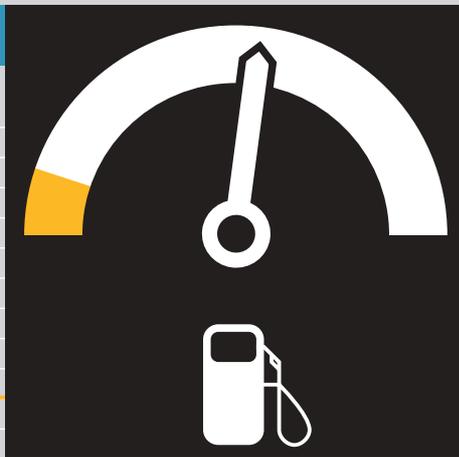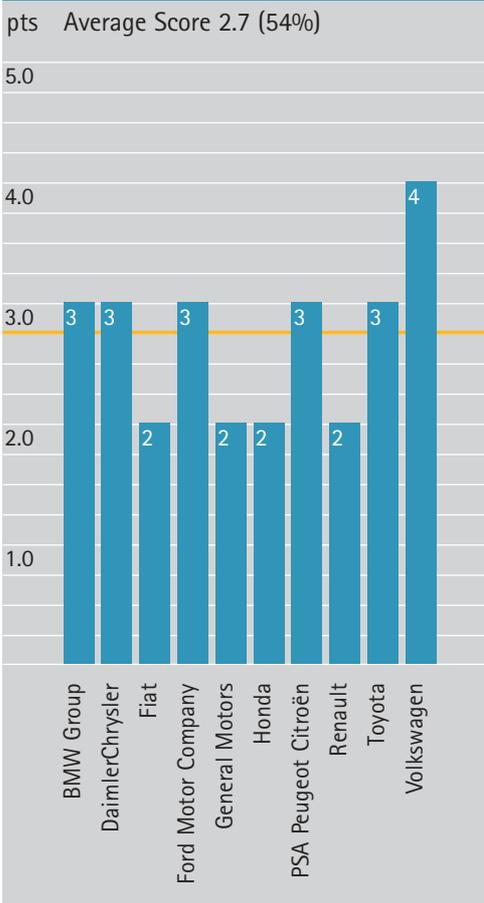
Life Cycles: Issues Benchmark

Our 2001 benchmark survey assesses the ways in which automotive companies define the LCM challenge and then communicate their visions, strategies, plans and performance. This includes addressing issues of dematerialisation and detoxification, recognising the importance of value chain partnerships. The scores show **BMW**, **DaimlerChrysler**, **Ford**, **PSA**, **Toyota** and **VW** taking the lead, at least when it comes to reporting.

VW's reporting in this area covers its commitment and actions to influence the industry, and its programs and workshops in the area of design, life cycle analysis and recycling. **Toyota** extensively outlines its actions around development and design, procurement and recycling. However, none of the companies mention the possible route of monomaterial parts, such as that used by the Rocky Mountain Institute in its design of the *Hypercar*.

With this methodology, **VW** score highest, but we are sensitive to two qualifiers: the **VW** approach is far from perfect; and **VW** lobbied extensively against EU aspects of 'take-back' rules.

Ford Motor Company

'We are increasingly defining end-of-life cars as 'technical nutrients'. So the car will be built, then it will be disassembled — and the materials will rebuilt into a car again.'
Ford Motor Company [70]

15   Life Cycles: Issues Scores

pts   Average Score 2.7 (54%)

Company	Score
BMW Group	3
DaimlerChrysler	3
Fiat	2
Ford Motor Company	3
General Motors	2
Honda	2
PSA Peugeot Citroën	3
Renault	2
Toyota	3
Volkswagen	4

Where will Reporting be in 2003–5?

To reflect a growing cohesiveness of thought, reporting on life cycles should include discussion of the difficulties around changes in decision-making in manufacturing-focused companies. Where the focus has so far been on technology, influencing the way people in organisations think about the tools and processes they use is critical. We would suggest that in the new crop of reports, a more innovative way of thinking and reporting about life cycle impacts should be adopted.

64 'Vehicle recycling and the ELV directive: an opportunity for the European industry to combat pattern parts', just-auto.com 18 July 2000.
65 Tim Burt, 'VW is set for £330 million recycling provision', *Financial Times*, 12 February 2001.
66 Volkswagen, *Environmental Report*, 1999/2000.
67 Concept developed by Michael Braungart and Bill McDonough of McDonough Braungart Design Chemistry, www.mbdc.com
68 'Components of an output revolution' *Financial Times*, 10 April 2001.
69 'Recycling centres for Toyota's 'green' cars', *Financial Times*, 11 September 2000.
70 Bill Ford, Ford, *Connecting with Society*, 1999.

Life Cycles: Technology

Life cycle thinking and management approaches are equally relevant to technology, behaviour and systems. But current reporting focuses on the technical aspects of auto life cycles. Among the areas we would like to see reporting cover by 2003—5 are:

— Trends in the mix of materials used in vehicles and other products, in terms of e.g. toxics, recyclability and recycled content;
— Proportion of renewable materials used, plus initiatives to boost renewable content;
— Benchmarking of progress in moving towards closed loop methods against best practice in auto and other sectors;

— Use of the 'Hypercar' concept as a benchmark to stretch against;
— Barriers to change.

Life Cycles: Behaviour

The reports surveyed have considerably less to say on the behavioural dimensions of the life cycle and take-back agendas. Among the areas we would like to see reporting cover by 2003—5 are:

— Frank discussion of trade-offs incurred during life-cycle projects;
— Use of stakeholder engagement processes in defining priorities and making tough choices;
— Remaining dilemmas;
— Use of full cost accounting and other methods to track and manage externalities;

— Progress in educating and informing customers and other stakeholders on life-cycle issues;
— Barriers to change.

Life Cycles: System

EU take-back requirements represent a determined effort to effect system-level change. Among the areas we would like to see reporting cover by 2003—5 are:

— Work on national, regional and global end-of-life standards for vehicles;
— Current baseline standards and future targets;
— Progress in creating markets for waste materials and 'technical nutrients';
— Thinking (and public policy positioning) on market shaping by means of pricing and taxes;

— Progress in developing 'business ecosystems', with technical nutrients exchanged between different plant, companies and sectors;
— Barriers to change.

What's the Problem?

Many of the world's cities are infinitely better places to live than they were a century or two ago. Indeed, statisticians tell us that the first great demographic benchmark of the 21st century will occur in 2005, when for the first time in human history most of the world's people will live in cities. Urban populations are growing three times as fast as rural populations, with most of the growth taking place in developing countries — where already some 40% of the population is opting for city life. [71] In the process, modernisation and rising incomes create a growing dependence on road transport in general, and on the private motor car in particular.

'No problem there', automotive sector companies will say. People choose to use cars because they provide levels of service and convenience which public sector solutions cannot, or at least do not, offer. For most individual motorists, access to a car is a key metric in terms of their perceived quality of life. Mobility, flexibility and status are just some of the benefits a car can bring. However, even the most avid motorist is sometimes forced to admit that too much of a good thing can cause unexpected problems.

Increased mobility is liberating and socially progressive up to a point. Beyond this point it can become socially destructive — especially when accompanied by increasing disparities in levels of mobility. The emerging trend dubbed hypermobility accelerates the time-scales and sharpens the impacts. The results can add up to a vicious cycle: [72]

— Greater disparities between rich and poor (with the rich increasingly insulated from the problems of the less well-off);
— More suburban sprawl;
— The growing dependence on cars spurs decentralisation, further disadvantaging public transport options;
— Neighbourhoods are increasingly anonymous and less convivial, as dangerous streets and falling air quality keep families and children indoors;
— The dangers grow for those not in cars;
— Falling social cohesion can drive up crime levels;
— Less exercise leads to obesity and ill-health;
— As self-policing of cities falls, there is a growing demand for Orwellian styles of policing, with CCTV surveillance.

Among the issues that have become more challenging as the use of the car has spread are urban congestion and urban sprawl, air quality, the disruption and severance of communities along major roads, the disenfranchisement of those who do not have easy access to cars, the erosion of urban quality of life, a range of safety issues, and a spectrum of local, regional and global environmental impacts.

Automotive sector companies assure us that they are deeply involved in the resolution of such problems, but you would hardly guess that there were such problems from reading the reports of those most involved in shaping our common future around road transport and cars. These include infrastructure and equipment companies: road builders, automotive manufacturers, fuel companies, and all those who sell and service their products.

But even if you cannot find the full story in their reports, the technical achievements of the automotive sector in recent decades have been extraordinary. Safety was a critical issue for the sector in the 1950s and 1960s, and remains a major concern, although cars these days are generally much safer than they used to be.

Then environmental pollution began to become more of a headache, particularly as static pollution sources like factories and power stations were cleaned up. The photochemical smog problems that plagued major cities like Los Angeles and Tokyo helped drive new forms of air quality regulation, leading to major changes in engine design and fuel formulation, and promoting the widespread adoption of new technologies, particularly catalytic converters.

Unfortunately, such technical achievements have often been neutralised by behavioural or system-level trends. Cars may be cleaner, for example, but there are many more of them now, often idling in traffic jams. And the evidence suggests that things will get a lot worse before they have any chance of getting better.

Predicted levels of car ownership in emerging and developing economies are worryingly high. In Asia, people in newly industrialised countries could purchase as many as 500 million new vehicles by 2020. [73] Having already witnessed the decline in social and environmental quality of life in many western (sub)urban are as, there are huge ramifications for the developing countries if they opt for automobility.

3.3
Liveable Cities
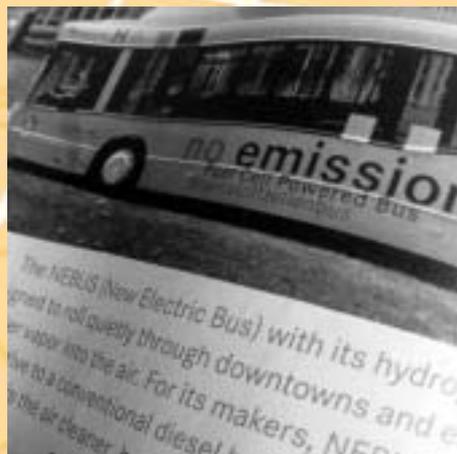
DaimlerChrysler

'All over the world, wherever our activities take us, we demonstrate a commitment to conserving natural resources and enhancing the quality of the environment — and the quality of life.'
DaimlerChrysler [74]

Is it on Corporate Radar Screens?

The Holy Grail for automotive companies seems to be guilt-free motoring. At least in the rich world, the technological answer is perceived to be the fuel cell. However, when we bring the global demographics of population growth, increasing affluence and the rapid growth of megacities into the equation, we rapidly need more than technological fixes to solve the resulting problems.

— 'Mass car ownership and individual mobility clearly have drawbacks in terms of their impact on our natural surroundings — the car ranks alongside domestic heating, industrial processes, heat and power stations, and agricultural enterprises as one of the main sources of emissions of nitrogen oxides, sulphur dioxides, particulates, carbon monoxide and hydrogen sulphides. It also emits gases implicated in climate change, in particular carbon dioxide.'
Volkswagen[75]

To be fair to the industry, there is evidence that new thinking is emerging on these issues. As discussed in Section 3.2, a key factor helping to turn the tide is that car companies — whether or not they like it — are becoming increasingly responsible for their impacts up and down the value chain. This includes the use phase of the vehicle, previously perceived as beyond a company's remit. Partly as a result, some major companies are beginning to think about providing lifetime services to consumers, which would also involve a capacity to manage the entire life-cycles of vehicles.

The focus, though, is still very much on seducing and serving the motorist. Take the booming area of in-car navigation systems. Automotive companies are investing heavily in telematics. Deutsche Bank analysts predict that the telematics market will grow from $1 billion in 1998 to $42 billion in 2010.[76] Here the focus is often on helping better-off drivers get around congestion problems.

Meanwhile, a small number of companies — including some in the IT sector — are conducting mobility experiments, looking at different mobility options based on a combination of transport modes. Few companies, however, address the behavioural or system-level changes that are going to be needed. A rare reference to emerging consumer concerns — and, potentially, to new needs and services — came from **Renault**:

— 'We are witnessing a not insignificant change in attitudes to vehicle use. Some of our customers are prepared, to a certain extent, to modify the manner in which they use their vehicles, accepting that there are situations in which it is not absolutely necessary to drive. This is a very recent trend.'
Renault[77]

But it would be foolhardy to draw too many conclusions from such early trends. **VW**, for example, reports that whilst customers may be starting to demand eco-friendly vehicles, a high percentage (45%) are not inclined to pay more for them. The obvious questions: can auto-makers work with some of the much smaller groups that are prepared to pay more to incubate new sustainable mobility products and services? And what can governments and NGOs do to accelerate the process?

What's their Big Idea?

Overuse of what is essentially a luxury item has often devalued the car to the point where there is a loss of its core functions, mobility and access. In response, car companies have concentrated on improving the product (as with on-board navigation systems), and compensated by creating other functions such as in-car entertainment.
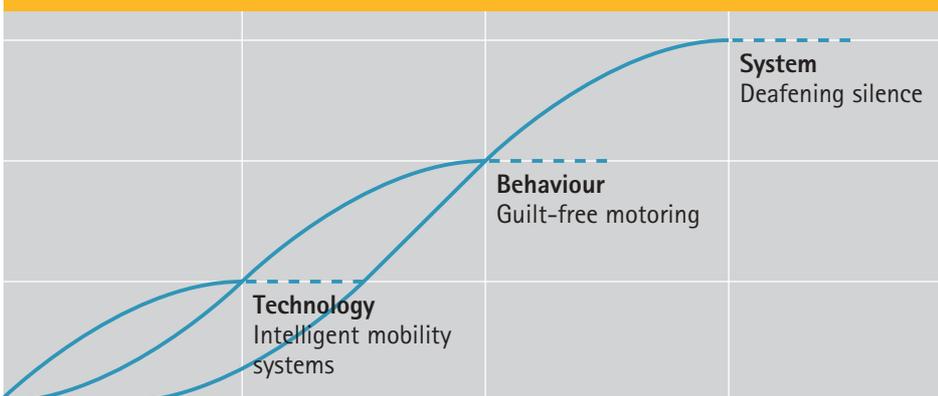
So the current 'Big Idea', insofar as there is one, is generally based on technologies which enable motorists to avoid the problems they are helping to create, to ensure — as far as is possible — guilt-free motoring. When it comes to behavioural and system-level changes, **Automobility–10** reports have strikingly little to say.

Telematics will help drivers find ways around the traffic jams, or failing that, connect them to the wired world so that, while stuck in traffic, they can communicate as efficiently as if they were at home or in the office.[78] **GM**'s OnStar system has been developed from a navigation and emergency response system to embrace other multimedia functions, such as video and e-mail. Automotive manufacturers supply the products consumers demand, feeling it is not their responsibility what consumers then do with the products. However, as the major tobacco companies have found, this can be a risky assumption.

On the basis of their reporting, European and Japanese auto-makers often seem to be light years ahead of their US counterparts. This may have a great deal to do with the fact that in both the EU and Japan the population is more concentrated, sharply highlighting the need for solutions. **PSA** in France, for example, dedicates a quarter of its environmental report to asking the question 'Why reconcile the car with urban life?'

16   Liveable Cities: What's their Big Idea?

Triple Bottom Line Improvement

System
Deafening silence

Behaviour
Guilt-free motoring

Technology
Intelligent mobility systems

Time

'The satisfaction of these needs has led to growing concerns about the impacts of current modes of transportation on the world's environment, public health and safety, and the quality and patterns of life.'
General Motors[79]

The company sees it as a major issue they need to tackle — and plans to take a central role in improving quality of life in urban areas. They have invested in new concepts of urban mobility: Liselec, for example, is a self-hire electric vehicle service, accessible through subscription only, working in city centres (initially La Rochelle in France). It is a partnership experiment between **PSA**, la Générale de Transport et d'Industrie (VIA GTI) and Alcatel CGA Transport.

Meanwhile, **DaimlerChrysler** has been working in partnership with other organisations (specifically Siemens AG and the Berlin Transportation Authority) to form the Centre for Traffic Management (VMZ) in Berlin. Aimed at implementing intelligent traffic control systems and ensuring comprehensive traffic management, the service focuses on data quality, and offers advice on the best use of public transport.[80]

What's Missing?

Companies have focused intensely on improving technology as far as possible — the result being better tailpipe emissions and safety statistics. What companies fail to address is the growing breakdown of the current transport system and the role of their product — the car — within that system. This relates to a wider definition of impacts, and the responsibilities associated with those impacts. In urban areas, the collective impact of a growing dependence on cars has meant that urban planning is biased towards car-focused activities, alienating the infirm, the poor, the young and the old. It has also meant that overuse of the car has lead to severe congestion in urban areas, cancelling out its function — that of mobility. The response of automotive manufacturers — technological improvement rather than behaviour or system-level change — is currently inadequate and will need to shift up a gear.

18 Liveable Cities: Issues Survey

Our 2001 liveable cities reporting benchmark survey assesses the ways in which a given automotive company tries to define the challenge — and then communicates its vision, strategies, plans and performance. The information was scored on the basis of how well each company demonstrates the link between the liveable cities challenge and its activities, together with the way it describes its relevant portfolio of strategies, products and initiatives.

The graph shows that, even on fairly generous scoring, the industry still has a long way to travel in relation to addressing the closely linked liveable cities and quality of life issues. Overall, the **Automobility–10** score 1.6 out of 5 (32%) in terms of reporting on the liveable cities agenda.
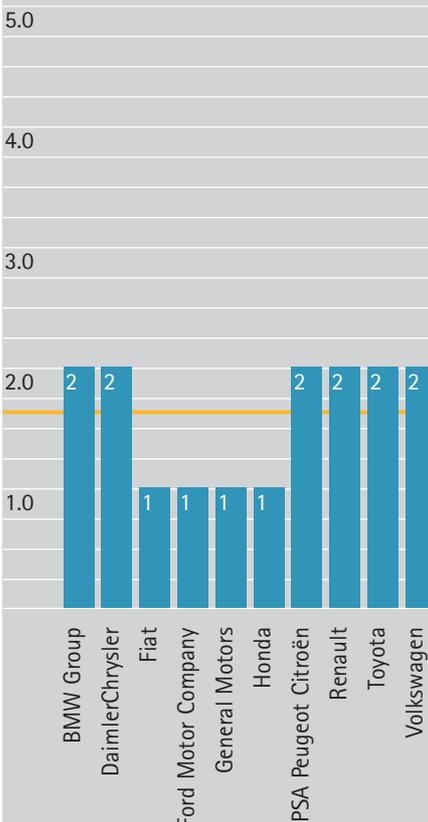
Volkswagen

'. . . And the more cars there are, the more countryside is asphalted over and dissected by roads and motorways. As we at VW move beyond the mere production of motor vehicles to tackle mobility issues, there is an increasing need for cooperation on a global, cross-sectoral basis — and this requires a quantum leap in terms of vision and innovation.'
Volkswagen[81]

17 Liveable Cities: Issues Scores

pts   Average Score 1.6 (32%)

Company	Score
BMW Group	2
DaimlerChrysler	2
Fiat	1
Ford Motor Company	1
General Motors	1
Honda	1
PSA Peugeot Citroën	2
Renault	2
Toyota	2
Volkswagen	2

71 www.prb.org/wf/quickfacts_ urbanisation.html
72 John Adams, *The Social Implications of Hypermobility: Speculations about the social consequences of the OECD Scenarios for Environmentally Sustainable Transport and Business-as-Usual Trend Projections*, OECD January 2000.
73 M Carley and P Spapens, *Sharing the World — Sustainable Living and Global Equity in the 21st Century*, Earthscan, 1998.
74 DaimlerChrysler, *Environmental Report*, 1999/2000.
75 Volkswagen, *Environmental Report*, 1999/2000.
76 'Driving in my (telematic) car', *The Observer*, 1 October 2000.
77 Renault, *Environmental Report*, 1999.
78 'Driving in my (telematic) car', *The Observer*, 1 October 2000.
79 General Motors, *Steps Towards Sustainability*, 2000.
80 DaimlerChrysler, *Environmental Report*, 2000.
81 Volkswagen, *Environmental Report*, 1999/2000.

Where will Reporting be in 2003–5?

Reporting on liveable cities is currently very poor. Innovation in terms of the product is restricted to technology, and rarely addresses the behaviour of customers with respect to the choice of mobility for their journey. Companies continue to play their part in perpetuating the system of car-based transport. How they address the challenges and dilemmas represented by participating in such a system will be crucial as they begin to redefine their role.

Liveable Cities: Technology

Urban areas are where we come most immediately into contact with the upsides and downsides of our mobility technologies. The technology-focused changes covered under earlier 'Climate Change' and 'Life Cycles' sections will help change behaviour and shape urban mobility systems. Among the areas we would like to see reporting cover by 2003—5 are:

— Road accidents, injuries and deaths (including e.g. passenger, pedestrian and cyclist statistics) by vehicle type and model;
— Safety and quality aspects of fleet performance, for example number and type of product recalls;
— Significant urban pollutants produced per vehicle mile per vehicle type and model;

— Emerging technologies as potential elements in future sustainable mobility packages;
— Barriers to change.

Liveable Cities: Behaviour

The surveyed reports have surprisingly little to say on the subject of how we might adapt the behaviour of urban populations to ensure more sustainable patterns of mobility and access. Among the areas we would like to see reporting cover by 2003—5 are:

— Use of wider stakeholder engagement tools and processes;
— Response of different stakeholder groups to transport, mobility and access issues;
— Comparison of trends in different countries and world regions;
— Development of key performance indicators (KPIs), and extent of stakeholder involvement in process;

— Participation in (and results of) urban mobility and access experiments;
— Barriers to change.

Liveable Cities: System

Urban planning may not be the auto companies' business, but their products certainly have massive implications for urban planning. Issues like sprawl are rarely discussed in today's company reporting. Among the areas we would like to see reporting cover by 2003-5 are:

— Trends in urban structure (including urban sprawl and its wider implications);
— Social, equity and environmental implications;
— Company activities designed to spur system-level changes in mobility and access;
— Progress with efforts to integrate different transport modes;

— Involvement in efforts to evolve sustainable mobility systems in major urban areas;
— Barriers to change.

What's the Problem?

Renault is unusual in even raising the issue of whether rich world mobility solutions are suitable for poor world countries. Reports by the **Automobility–10** companies are generally weak in terms of their coverage of developing and emerging economy issues. This is worrying, since the evidence suggests that the majority of the **Automobility–10** have global ambitions. And there is no shortage of emerging economy issues and significant impacts.

It is forecast that by 2010, more than a third of all vehicle sales will be in less-developed countries. Already, cities such as São Paulo, Cairo, Lagos, Mexico, Bombay and Jakarta are overwhelmed by automobility, air pollution and sprawl. In São Paulo, for example, a fleet of five million vehicles is growing by 250,000 per year and contributes an estimated 90% of polluting gases and particulates emitted every year. [82]

According to India's Centre for Science and Environment (CSE), there is one car in the USA for every 1.6 people. If Indians were to strive for this same level of car ownership, the number of cars in the country would increase from 4 million to a staggering 625 million. [83]

With over a billion people in the world living on a dollar or less per day, automotive industry critics protest that valuable cropland, urgently needed to feed hungry populations, is being paved over to provide roads for the car-owning minority. In rural Asia, according to Eviction Watch Asia, some 100,000 to 150,000 families are evicted every year, nearly half of them to make way for new highways. [84]

Whilst there is no question that road transport and other mobility options facilitate access to economic opportunities, focusing on the automobile and road transport to the detriment of other modes can hit those most in need — and they are the majority in developing and emerging economies.

When challenged, automotive sector companies tend to say that their main responsibility is to make available safe, functional and affordable vehicles, not to shape emerging economy transport and mobility systems. The problem is that by the simple act of making available safe, functional and affordable vehicles they are having a dramatic impact on the ways in which poorer countries think about their future. This fact implies new responsibilities — and, potentially, new forms of accountability — for the automotive sector.

Is it on Corporate Radar Screens?

The crop of reports under review have little to say about emerging economies and markets, either as opportunities or as new areas of challenge. But, whether or not their reports make this clear, rich world auto-makers are acutely aware of the potential markets created by demographic and economic trends in the emerging economies. Faced with market saturation in their established markets, they are increasingly looking around for opportunities that will help fuel their own future growth.

Selling smaller and cheaper vehicles, major manufacturers have flooded into Eastern Europe, South East Asia and South America with varying degrees of success. This results in a worrying trend in some cities.

Reorientating their mobility strategy around the relatively small number of people driving squeezes out the majority of other road users (on bicycles or using rickshaws, for example) to make way for cars. This has happened in south Bombay, New Delhi and Beijing where such users may even have been banned.

The 'CNN World', with rapidly increasing levels of transparency imposed on business and governments alike, has meant that the social, environmental and economic impacts of automobility are coming under scrutiny the world over. As a consequence, we are seeing a small number of companies at least raising interesting questions. One case in point is the **Ford Motor Company**:

— Another opportunity lies in meeting the mobility needs of the vast majority of the world's population for whom automobile ownership is a distant dream. Actively or passively, most global companies have aimed their products or services at the most affluent regions of the world and the elites within emerging economies. A consumer-driven company cannot afford to overlook the wants and needs of billions of potential customers, but serving these customers will require vastly different approaches, new business models for delivering products and services and considerable cultural sensitivity. It also requires explicit consideration of the company's role in creating — not just tapping — wealth. **Ford Motor Company** [85]

Generally, however, such perspectives are the exception rather than the rule.

3.4 Emerging Economies

'In the context of rapid growth in urban development taking place in the developing nations, we consider the role of transport in the city and that which the car can play in the mobility scenario. However, this is not a matter of imposing our models of urbanisation and car ownership on these countries in which, unlike Europe, the city is not built for growing numbers of cars.'
Renault [86]

What's their Big Idea?

Despite a few well-chosen quotes, none of the companies reporting shows any real evidence of having thought through the 'elephant in the bedroom' issues when it comes to emerging markets. [87] This is a 'Big Idea'-free zone, at least as far as the reports under review are concerned.

Reading between the lines, however, it is clear that most of these companies are keen to capitalise on such new markets. In fact, the emerging economies, once regarded as too poor to provide a reasonable return, are increasingly seen as key to the future of the automotive industry.

Given this fact, it is striking that these companies seem unsure of the best technology bets for emerging markets, instead opting for business models, technologies and products that seem increasingly obsolete in the developed world. Here, too, these reports would suggest that there are exceptions, among them **Renault**:

— 'Renault's philosophy is to place ecological vehicles offering top-class performance in terms of fuel economy and low emissions, and built at the lowest possible cost, at the disposal of growing numbers of people.' **Renault** [88]

In terms of behaviour, auto-maker strategy has been to maintain a foothold in emerging markets, garnering market share, building reputation and attaining brand awareness in anticipation of economic development. Japanese manufacturers have historically been strong in Asia, but globalisation now means that all manufacturers are interested in new markets.

Partnerships with local companies are important for **DaimlerChrysler**, which has bought a stake in Mitsubishi and Hyundai to develop small cars for key markets. **GM** recently entered into a joint venture with Avtovaz, a Russian auto-maker, and doubled their position in Suzuki Motor, the apparent strategy being to exploit emerging markets and develop small vehicles for Europe and North America. [89] Meanwhile, **Renault** has acquired Dacia in Romania, and Samsung Motors in South Korea, the second biggest Asian market. [90]

Honda's declared strategy is 'glocalisation', a combination of a global strategy with highly local implementation. Designed to place cost-effective plants in areas that best meet the needs of local customers, this strategy gives them small local plants that take root locally and grow as demand grows, 'an approach that allows them to achieve efficiency and profitability, even at low production volumes'. [91] The concept of local customisation in smaller factories potentially represents a powerful boost to local markets.

On another tack, **DaimlerChrysler**'s experiment in South Africa marries a quest for renewable materials with local wealth creation. Considerable investment in know-how and new technology in formerly government-owned sisal farms has provided the company with material for car components. Built into their vehicles produced in South Africa, this renewable material is being tested for global roll-out. [92] The behind the scenes thinking runs as follows:

— 'For **DaimlerChrysler**, the principle of managing for sustainability applies also to emerging economies and third world nations. Through its activities, the company not only boosts local value added but also supports the establishment of an industrial infrastructure aligned with the criteria of sustainability.' **DaimlerChrysler** [93]
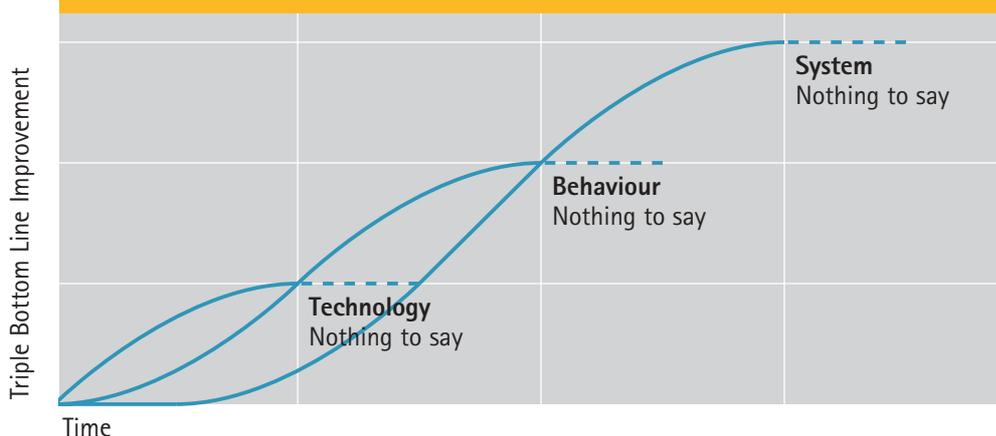
In a bid to build local research capacity, Ford also now sponsors two new Henry Ford chairs of research in India. One, at the Indian Institute of Technology, in Madras, is for research into vehicle emissions and environment; the other, at the Indian Institute of Technology in Delhi, focuses on research into biomechanics and transportation safety.

Renault, too, has established a mobility research platform with COPPE (the Federal University of Rio de Janeiro) to promote mobility solutions compatible with sustainable development in Brazil. BMW speaks of the way its Amata plant is helping drive improved social standards locally:

— 'The idea of local responsibility is simply indispensable . . . The Amata plant in Thailand . . . is setting new social standards in a number of ways, including the introduction of health insurance, a pension fund and a medical station.' **BMW Group** [94]

Despite this discussion of initiatives, they represent a tiny minority of reporting. Overall, coverage in this area is rare, fragmented and anecdotal.

18   Emerging Economies: What's their Big Idea?

Triple Bottom Line Improvement / Time

Technology
Nothing to say

Behaviour
Nothing to say

System
Nothing to say

What's Missing?

The first major omission is that companies rarely report on their emerging economy performance. Secondly, companies purely regard emerging economies as growth opportunities. They rarely recognise the repercussions that will occur if the environmental and social damage that has occurred in the developed world is replicated globally. Responsibility is avoided by suggesting that automotive companies have no right to influence the aspirations of emerging and developed economies. However, global transparency and accountability mean that corporate responsibility has become a necessity for emerging economies as much as the developed world.

Emerging Economies: Issues Benchmark

Our 2001 benchmark survey assesses the ways in which automotive companies define the emerging economies challenge and then communicate their visions, strategies, plans and performance. For a high score in this area, a company would need to demonstrate not just an awareness of the nature and scale of any market opportunities for vehicle sales, but also a degree of self-awareness with respect to the first, second and third order implications of its involvement in a particular market.

Coverage of emerging economy issues is conspicuously rare in automotive sector reporting. When there is some mention of such issues, it is usually with respect to growth opportunities and the linked 'need' to provide rapid and affordable access to cars, along with the related infrastructure.
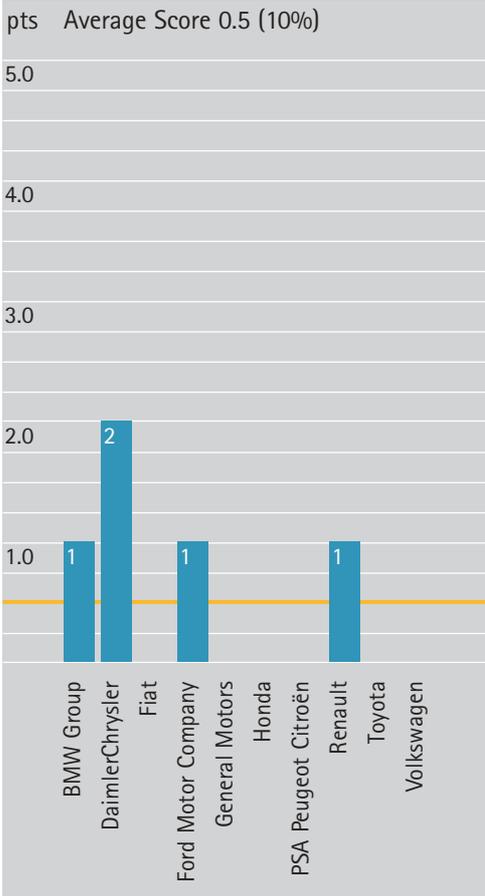

General Motors

General Motors

19 Emerging Economies: Issues Scores

pts   Average Score 0.5 (10%)

Chart showing scores by company:
- BMW Group: 1
- DaimlerChrysler: 2
- Fiat: (none)
- Ford Motor Company: 1
- General Motors: (none)
- Honda: (none)
- PSA Peugeot Citroën: (none)
- Renault: 1
- Toyota: (none)
- Volkswagen: (none)

Y-axis scale: 1.0, 2.0, 3.0, 4.0, 5.0

Where will Reporting be in 2003—5?

The development of clean and equitable solutions to mobility, the use of integrated modes of transport and the potential to provide the vast majority, not just the wealthy, with access to goods, services and work and therefore opportunities to improve their quality of life, will be key factors for automotive companies of the world. The spread of reporting must expand to include global information. Companies will need to include discussion of dilemmas and performance globally, not just the well-established (but saturated) western markets.

[82] M Carley and P Spapens, *Sharing the World — Sustainable Living and Global Equity in the 21st Century*, Earthscan, 1998.
[83] Adapted from A Agarwal, S Narain and A Sharma (eds), *Green Politics*, CSE, New Delhi, 1999.
[84] Walter Hook, 'Making Urban Transport Sustainable, How the majority travels and their mobility needs are addressed', *Gate Magazine*, 98/3, GTZ.
[85] Ford, *Connecting with Society*, 2000.
[86] Renault, *Environmental Report*, 1999.
[87] Mentioned in *The Global Reporters*, 'the elephant in the bedroom' commonly refers to the obvious fundamental facts of sustainability impact either not recognised — or actively airbrushed out of — the picture a company paints. The term was coined by Alcoholics Anonymous.
[88] Renault, *Environmental Report*, 1999.
[89] 'GM Tries to Show Who's Boss', *Business Week*, 12 March 2001.
[90] Strategy section at www.renault.com
[91] www.hondacorporate.com/worldwide/index
[92] DaimlerChrysler, *Environment Report*, 2000.
[93] DaimlerChrysler, op. cit.
[94] BMW Group, *Taking Responsibility*, 2000.
[95] General Motors, *Annual Report*, 1999.

Emerging Economies: Technology

The assumption often made is that rich world auto technology will cascade to the poorer world regions, with some degree of time lag. But what about the prospects for helping the poorer countries to leapfrog rich world problems? Among the areas we would like to see reporting cover by 2003—5 are:

— How are companies helping to meet the basic mobility needs of poorer markets?
— Leapfrogging strategy;
— Thinking on 'appropriate' technologies;
— Technology transfer trends and initiatives;
— Local progress in e.g. retrofitting older vehicles;
— Barriers to change.

Emerging Economies: Behaviour

Out of the media spotlight, rich world auto companies may feel less pressured in less developed and transition economies. On the other hand, some see these countries' exploding populations as a huge potential market opportunity. Among the areas we would like to see reporting cover by 2003—5 are:

— Company's role in local wealth creation
— Numbers of skilled and unskilled jobs created;
— Levels of technology and materials sourced locally;
— Multiplier effects in local economies;
— Social and environmental issues and priorities;
— Variance of local from global standards and performance;

— Emerging business models, e.g. B24B (business to 4 billion poorer customers worldwide);
— Barriers to change.

Emerging Economies: System

If system-level change is tough to achieve in the OECD world, it is going to be even harder in the emerging economies and poorer world regions. But this is where the threat of 'lock-in' of unsustainable transport systems is perhaps greatest. Among the areas we would like to see reporting cover by 2003—5 are:

— Development of system-focused initiatives and partnerships;
— Lobbying for infrastructure development of different types;
— Challenges of developing and marketing different mobility systems for different markets;
— Strategies for spurring and assisting transition to more sustainable systems;
— Barriers to change.

Three Conclusions

These are the main conclusions emerging from the third sector study carried out for the **SustainAbility/UNEP** *Engaging Stakeholders* program. They are based not on an in-depth survey of corporate strategies in the sector, but on an in-depth benchmarking of information provided in the reports and websites of ten of the world's largest auto-makers (the **Automobility–10**).

The sustainable mobility agenda, which will take decades to resolve, will bring many major companies to their knees, and will often depend for its resolution on governments prepared to take a stand against their own voters (operating as car owners, motorists and car-users), something which they have found singularly difficult to do during recent campaigns to force governments to cut fuel prices.

1 A critical public policy issue of the late 20th century, road transport will remain a central problem. There will be economic, social and environmental concerns, often fiercely contested and cross-linked, which the automotive sector will find increasingly difficult to address on its own.

2 To date, automotive sector companies are mainly working from an eco-efficiency mental (and business) model, stressing the role of technology rather than focusing on the bigger levers of behavioural or system-level changes.

3 On the basis of the thinking and experimentation reported in these companies' 1999-2000 reports and linked websites, the major auto-makers cannot currently — and very likely will not in future — deliver sustainable mobility solutions on the scale likely to be demanded.

4.0
Conclusions and Recommendations

'The race to acquire environmental protection technology is one of the driving forces behind auto industry realignment.'
NikkoSalomonSmithBarney [96]

Four Challenges

The nature and scale of the sustainable mobility agenda is slowly becoming clear to leading automotive sector companies. That said, they often struggle to put it into words. One of the best encapsulations of the challenge was this statement from the world's largest auto-maker:

— 'Sustainable mobility . . . is much more than our products. It is much more than our stated vision of a hydrogen-based infrastructure for the transportation sector. What it is about, is weighing the technology improvements, with public policy approaches and concepts of social organization on one axis of a very complex matrix, against very challenging environmental, energy, economic and social issues on the other axis.'
General Motors [97]

For 'very complex matrix', read Gordian Knot. The ever-shifting complexity of the sustainable mobility agenda is captured in *Driving Sustainability*'s central motif (Figure 04, page 04).

Critics will no doubt say there are many other issues than those we have chosen to focus on in our four issues sections. But we conclude that the automotive sector's ability to deal with climate change (page 13), life cycle management (page 17), quality of life issues in liveable cities (page 21) and the sustainable mobility needs of emerging economies (page 25) will be make or break tests of its economic sustainability over the coming decades.

Without wishing to under-value the progress some companies have made in recent years, including the growing levels of corporate transparency, a close analysis of their reporting to date suggests that they are still a long way from working out what to do with the sustainable mobility challenge. In each of the Big Issue sections, we ask the question: 'What's their Big Idea?' Basically, this attempts to dig down to the single most important element in current industry thinking about how to tackle the particular issue. Figures 20—23 indicate our assessment of the current state of play.

20 Climate Change

Climate Change
To achieve their ambition of 'guilt-free motoring', auto-makers know they are going to have to pull a rabbit out of the magician's hat. Their best hopes of doing that, on current information, seem to be hybrid vehicles, and vehicles powered by fuel cells, with a growing consensus that hydrogen could be the fuel of choice. The 1999—2000 reports are generally weak on climate change solutions, although there is evidence that the sector is waking up to the nature and scale of the challenge. And most companies cling to their highly profitable sport utility vehicles (SUVs), even though these are pretty much designed to fuel climate change.

BMW [98]

21 Life Cycles

22 Liveable Cities

23 Emerging Economies
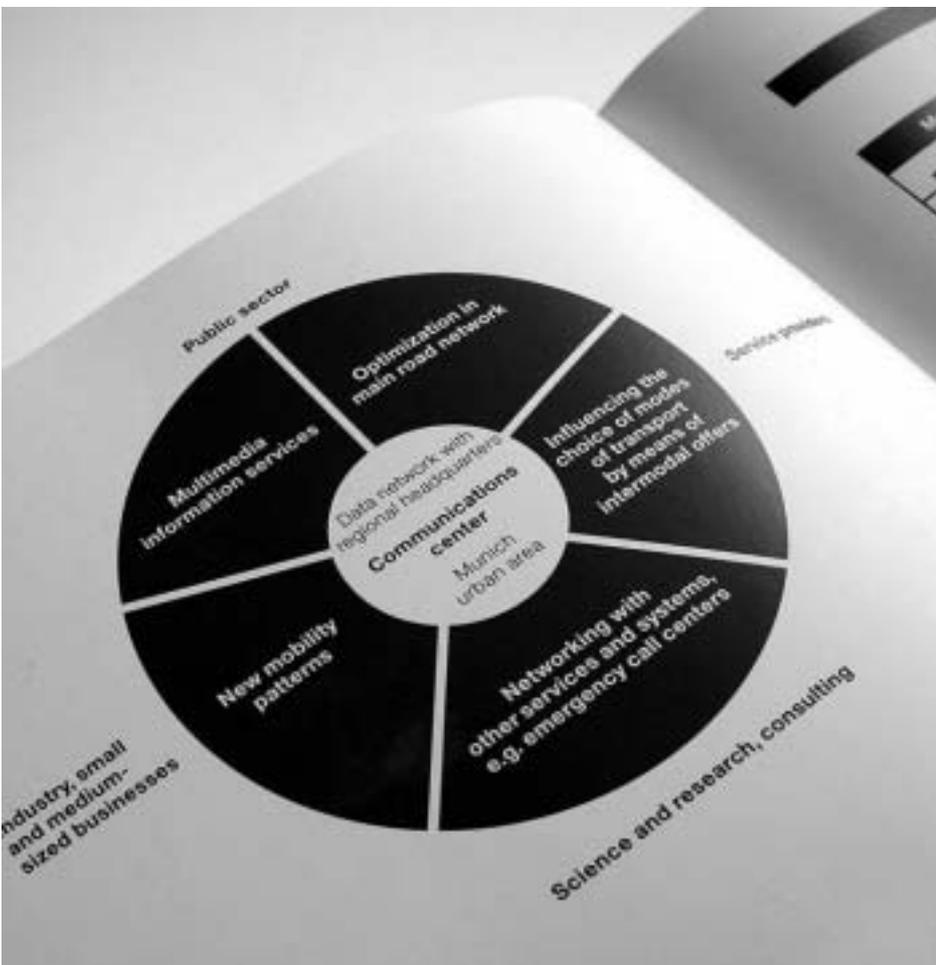
Life Cycles

To radically reduce their ecological footprints, auto-makers know that they will have to 'close the loop'. New legislation in the EU is already pushing them in this direction. But it is striking how little they have to say on this subject in their 1999–2000 reports, possibly because they have been lobbying so hard to stall or overturn the new rules. Is it possible that they fail to recognise such approaches as a necessary condition of the sustainable mobility they increasingly call for in their reports? Or is this simply a case of companies trying to put off the inevitable until the last possible moment? Whatever the answer, novel approaches like vehicle or component leasing are generally conspicuous by their absence.

Liveable Cities

In the right circumstances, a car can be a major contributor to our quality of life. Over time, the auto-makers have introduced cleaner engines and fuels, although rarely without a fight along the way. Essentially this has often involved tinkering with the technological problem. Meanwhile, quality of life in urban areas is falling, health is deteriorating and congestion increasing. Don't waste time looking for in-depth coverage of such issues in these reports, let alone proposed solutions.

Emerging Economies

Billions of extra people in the emerging economies translates into huge market opportunities for the right sort of cars, at least if you are an auto-maker. Companies neglect to cover their emerging economy impacts, rarely include their influence on economic development, and avoid the repercussions associated with replicating the environmental and social damage inherent in excessive car use, gradually being realised in developed economies.

Renault

Fiat

[96] NikkoSalomonSmithBarney, Global Equity Research, *Auto Industry 2000*, 27 June 2000.

[97] Dennis R. Minano, GM, Welcoming Remarks from Dennis Minano at WBCSD Sustainable Mobility Project Dialogue, 2001. www.gm.com

[98] BMW Group, *Environmental Report* 1999/2000.

Sustainable Mobility Reporting 2003–5

Boiled down to their essence, the sector's 1999–2000 reports focus almost exclusively on what might unkindly be described as 'technological fixes'. Just as the switch from horses to horseless carriages left the basic model of privately owned transport largely unaffected, and average urban speeds largely unaffected too, so the auto-makers appear to be hoping that by switching to cleaner fuels, like hydrogen, this profitable business model can be given a new lease of life well into the 21st century.

Anyone reading the reports, even those with a reasonable knowledge of ways in which the different automotive manufacturers view the sustainable mobility challenge, will find little information on the strategic intent of particular companies. There is little or no information on consumer trends, or on what companies are doing (or might do) to increase the public appetite for sustainable mobility. And there is nothing, or almost nothing, on what the companies, and their industry federations, are doing to brake (in rare cases, accelerate) public policy changes designed to make transport, mobility and access systems more sustainable.

To be fair, many of these reports do make interesting reading. A great deal of effort has gone into collecting the data — which is often their biggest contribution, in that the very task of reporting spurs the internal demand for management systems. It is a step-by-step learning process. But if 2003–5 reporting by auto-makers, and by other service providers eyeing opportunities in the sustainable mobility area, are to be really useful, they will need to address all levels of the strategic challenge. In assessing future strategy and reporting in the automotive sector, we will be looking for answers to the questions spotlighted below:

Technology

How does the company's current technology — and ongoing R&D efforts — relate to the four Big Issues spotlighted in *Driving Sustainability*?

How does the company's current product offering compare with those of its competitors in relation to key sustainable mobility performance indicators?

How do company strategies and activities measure up against known sustainable mobility options? So, for example, how does the fuel efficiency or overall ecological footprint of the latest year's vehicles compare with the performance of the 'Hypercar' offered by the Rocky Mountain Institute?

Behaviour

What research has the company done on the psychological and sociological aspects of consumer behaviour in this area?

What are the implications for the four Big Issues — and for sustainable mobility more generally?

What is the company doing to address the relevant barriers? What more might be done?

Systems

Where are existing or emerging transportation, mobility and access systems helping or hindering progress in relation to the Big Issues?

Where governments, at the urban, national or regional levels, are trying to drive change, what is the company doing in response? What is its public policy positioning? What lobbying groups is it part of — and what position does it take in shaping the relevant agendas and policy lines?

What is the company doing in each of the areas highlighted in **BMW**'s diagram (page 30), showing how networking, partnerships and new players can potentially shape the sustainable mobility agenda — and the solutions on offer?