A New Vision on European Mobility

Your mobility is part of your personality, your identity, how you think, how you behave. European mobility patterns reflect common values and mind-sets.”

MIND-SETS Deliverable 2.1a
Deliverable 2.1A:

**MIND-SETS: A new vision on European mobility**

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Project partners

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MIND-SETS. Mobility Innovations for a New Dawn in Sustainable (European) Transport Systems

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It was a normal Thursday morning rush hour...

Let us consider a simple observation that we can all see in our cities today. Walking down the street, even in the busiest cities, congested streets and metro platforms, you will find yourselves dodging men and women wearing headphones while at the same time texting messages on their smart phone – maybe you are one of them. This has only been seen over the last 5 years or so, yet is quickly being absorbed into ‘the normal way of doing things’. What was done sitting in front of the computer or laptop is now transferred into the mobile environment, transforming the traditional ideas of how people value their time. However, something else is apparent from observing these ‘street texters’. While others are taking in the natural environment of the street, all of its noise, its smells, of engaging with society; Street texters choose to exist in the parallel ‘virtual’ world; now extended into the very act of moving around in the street. They listen to music or the morning news on the radio; their minds are occupied with communicating and engaging with their peer group on smart phones. This virtual world, in the context of this commuting environment, is the preferred option to the physical experience of street life.

(Lead author’s observation, Euston Road, London, June 2015)
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Preface

MIND-SETS: A new vision on European mobility

The MIND-SETS project

The MIND-SETS project (Mobility Innovations for a New Dawn in Sustainable (European) Transport Systems) is funded by the Directorate General for Research of the European Commission, under the Horizon 2020 Programme. Horizon 2020 is the financial instrument implementing the ‘Innovation Union’, a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness - the means to drive economic growth and create jobs.

The MIND-SETS project is a completely new perspective on mobility. Mobility is the largest industry in the world and an industry experiencing rapid growth on all transport modes, an unceasing desire for mobility in European society and a vibrant economic sector full of new ideas, concepts and services for keeping Europe moving. The key to success is economic growth - while fully respecting the requirements to ensure ‘growth with sustainability’ and ‘growth with inclusion’. In this way, advances in mobility will proceed in harmony with European environmental and energy goals; and with the objectives to achieve greater social inclusion in European society and greater individual and social well-being.

In achieving these higher goals, it is important that those target groups responsible for the mobility means we all enjoy, understand which mobility innovations will be ‘game changing’ and grow economies; which ones will be accepted by different generations of the European public – and which one could be rejected and why. This requires a full understanding of the underlying value of mobility in people’s lives; whether they are making local journeys, national or trans-European: Whether they are on foot, cycle, by public transport on land, sea, by air. In addition, physical and virtual mobility (via the internet) are now fully integrated and one cannot understand one without understanding the other. Mind-sets centrally addresses this issue in 3 basic objectives:

- How to better understand mobility (to better influence and change it)
- How to predict the likely future attitudes to, and patterns of, mobility
- What forms of mobility policies, products and services will best meet these future mobility needs

In developing the MIND-SETS approach, the goal is to synthesise and coordinate current intelligence as building blocks for the new approach; and then to use the approach (through guidelines and a ‘Knowledge Centre’) to advise and support the key stakeholders in the wider European mobility industry.

One of the Commission’s important justifications for launching the MIND-SETS project was that, while we have good knowledge of mobility patterns, we still lack the basic understanding of mobility and how travel patterns may be influenced and changed. An important element of MIND-SETS is that it takes a step back from current professional analysis of mobility and travel patterns, to more fully understand how mobility is placed in the everyday lives of
Europeans; using and approach which embrace a wide range of intelligence from many disciplines.

**THIS REPORT AND ITS TWO SISTER REPORTS**

This deliverable (D2.1A) forms the synthesis report from two linked reports (D2.1B and D2.1C) produced within the MIND-SETS project under its second workpackage. The objective of this report is to provide a new perspective to understanding mobility through coordinating the intelligence from a wide range of disciplines: breaking down academic language barriers to identify common themes in thinking and approach.

This report combines with two sister reports (D2.1B) that brings together perspectives on understanding mobility from a wide range of disciplines, including economics, psychology, sociology, spatial analysis and social networking among others; and a further report, D2.1C, that develops an approach based on the analysis of the common values and mind-sets within different generations of European society. Both of these reports are then synthesized in this 'top report'.

Details of the 3 reports and their citations are as follows:

**THIS REPORT:**

Deliverable D2.1A: **MIND-SETS: A new vision on European mobility**


**SISTER REPORTS:**

Deliverable D2.1B: **MIND-SETS: Interdisciplinary perspectives on mobility**


And

Deliverable D2.1C: **MIND-SETS: A generational perspective on mobility**


It is hoped that this report, and its two sister documents, will spark a new line of thought and debate among mobility specialists and, through the forthcoming MIND-SETS guidelines and Knowledge Centre, provide the intelligence and support that stakeholders need in developing new mobility products and services that will meet future mobility aspirations in Europe and drive sustainable economic growth to the benefit of all.

Professor **Laurie Pickup**

MIND-SETS Technical Coordinator

October 2015
PART A:

Understanding mobility in a wider context
1. Introduction

1.1. Broadening the perspectives on mobility

*Mind-sets will open your mind to a mobility that does not just describe your ability to get from A to B; but a mobility that is part of you, a major element defining your identity: how you think, how you behave, how you respond to the environment around you.*

Whether for land, air, sea or through the internet, mobility is the biggest industry in the world. The MIND-SETS project will try to understand mobility. Not mobility as seen from within the traditional, narrow perspective of the transport planner, but to understand mobility from a much wider perspective.

Only by taking a step back and trying to understand mobility in this wider context can we hope to fully appreciate the rapidly changing mobile world in which we live. How do we understand the opportunities and dangers mobility can pose and the acceptance or rejection of the plethora of new ‘mobility policies, products and services’ that are being planned and offered to us.

To increase our understanding of mobility, the project has needed a new type of consortium which mixes those trained in conventional transport social science, to those trained in the broad set of disciplines that encompass the wider view of mobility – from neo classical to behavioural economics, from cognitive psychology and psycho-analysis to behavioural psychology, from the traditional...
‘vertical mobility’ of sociologists to the ‘Mobilities’ perspective, from social
go geography and mental maps. Importantly the project includes expertise
assessing future visions, such as the increasing mix of physical and virtual
mobility in our lives, automation, customisation and personalisation.

Each of these disciplines brings a new vision of mobility, each with its own
language and concepts; but each one providing important pieces of an evolving
jigsaw of how mobility defines us as individuals, families and neighbourhoods;
and how this will shape the future.

1.2. Mobility mind-sets

MIND-SETS was born from a realisation that the current passage of mobility
research was increasingly becoming a ‘progress trap’; and that – to make
innovative steps forward – there was a need to take a step back and re-examine
the fundamental roots of mobility from all perspectives. In doing this, the hope
is to find a new, accelerated understanding and direction for mobility policy
makers (in their broadest definition), and innovators in the mobility industry
seeking to penetrate new markets among populations where the hunger for
more mobility is unceasing.

This realisation was not only the view of the MIND-SETS consortium but also
of the transport and research policy making arms of the European Commission
in Brussels. Underlining the fact that the mobility industry is the world’s largest
industry, there was an increasing need to harness a new and fuller
understanding of mobility: in order for European industry to grow its
economy within expanding world mobility markets. In achieving this it is
essential that mobility growth happens in a sustainable way, and in a way that is
fully inclusive to all sections of society. The overriding objective of MIND-

SETS is based around the 3 guiding principles of planet (sustainability), people
(inclusion) and profit (growth). The project mission statement is:

To support mobility policy making, the mobility service
sector and the mobility industry:

enabling them to tailor their innovations to better meet
and stimulate future sustainable mobility demand -
enriching the lifestyles, experiences and well-being of all
Europeans.

At any one moment in Europe, there are thousands of travel behaviour studies
ongoing in municipal authorities, universities, consultancies and from within
the transport industry. Over the last 40 years, much has been learned from
these studies about the travel behaviour of different groups of society. We
know, for example, the social distribution of the types of journeys made their
mode, timing, length and duration. We have knowledge of the impacts that
greater mobility and accessibility have had on the volume of mobility in recent
decades, and the nature of that growth. We have knowledge of the impacts of
mobility deprivation on individuals. However, we still understand little of the
underlying processes that drive mobility decisions – what factors affect people’s
propensity to change their behavior?

Is it possible to identify a single, underlying mobility
mind-set in Europe?

What are the underlying ‘mobility genes’? Is it possible to identify a ‘mobility
DNA’ that manifests itself in different people, in different places and times; but
a mobility DNA where the genetic roots are more fully understood in a way that can enable us to appreciate it, to plan for it, to harness its opportunities, and to guard against the adverse impacts it can have.

In this context, the MIND-SETS journey has a simple logic:

- To absorb and digest the wealth of intelligence on mobility: combining ideas to create new innovation.
- To produce a new approach to understanding mobility; and to encompass this approach in guidelines which are tailored to meet the needs of the primary target groups.
- To actively exploit the approach, through the guidelines, by developing an interactive ‘MIND-SETS Knowledge Centre’, which policy makers, product, systems and service suppliers can use to make more informed decisions in growing their markets, and to achieve more sustainable and inclusive living.
- To use MIND-SETS to provoke further research and development in the field.

1.3. What this report aims to do

This report is the first stage of the MIND-SETS story. It draws on the impressive range of multi-disciplinary skills within the consortium to identify the building blocks of the MIND-SETS approach – the ideas and concepts, backed up by high quality research. This has, by the very nature of the task, produced a wealth of information. Each member of the consortium had sought to digest the ideas and concepts on mobility from their own disciplinary backgrounds, producing innovative ideas. In turn, the important interplay between consortium members has sought to further this innovation through seeking common and supportive elements in the thinking; overcoming the barriers of disciplinary languages into a single coherent form.
2. What is mobility?

Mobility is a fundamental freedom – it is one of the most fundamental freedoms we have; whether we choose to use it or not. As a result, mobility plays an important role in defining social status and power relationships between individuals, communities and countries. It defines the ability people have to move about in time and space to satisfy their activity needs; and thus plays an important role in influencing their life chances. It influences the possibility and course of personal relationships and social interaction. It dominates conversation; as people reflect on the wider experiences they have had from increased mobility and of the travel experience itself. It happens quite often that when two people meet for the first time that some comments are made to establish the relative mobility level (and thus expected respect) of each person. It is an important defining element in a person’s self-esteem and self-achievement through the course of their lives; and an important factor defining their projected personality to others. In summary, mobility is a central feature of our identity; both as we feel it and how others see it. It also explains why measures to restrict mobility meet with the strongest opposition.

While mobility freedoms bring to individuals greater feelings of control and social advantage, it is important to underline that mobility does not have to be fully expressed; particularly where most activities are easy to reach in the local area – there is a difference between mobility potential and mobility use. In this context, it is important to remember that most societies do not support the
Mobility is about freedom. Accessibility is about meeting needs. These two factors are frequently mixed and misinterpreted. In highly mobile dependent societies such as in Europe, mobility has a large influence on access. However, it is perfectly possible to have highly mobile people living, for the most part, local accessible lives. Also to have people with low mobility suffering the disadvantages of the need to access distant activities with limited means.

In an increasingly culturally diverse Europe, social inclusion becomes an important policy goal when exploiting the benefits of new ‘mobilities’.

The mobility horizons of 2020 and beyond will reflect quite different lifestyles to those experienced in the late 20th century. At the macro scale, the migration of European (and World) populations between countries continues to accelerate for economic and lifestyle reasons. On an annual basis business and leisure mobility is now the largest economic sector in the world. People now have the ability to live and work in several countries; whether they are professional workers or low income economic migrants. All of this will influence the social development of European society. The mobility industry is also a major employer in the European economy; in primary manufacture, systems supply, on the ground operations, or people working within communities providing mobility advice and support. It is essential in meeting future mobility needs that the opportunities of mobility growth take account of the living and working conditions of workers in the industry.

Mobility is increasingly becoming a fundamental aspect defining the character and lifestyles of Europeans, changing the diversity of European culture.

While the overall numbers of journeys that people make at the regional and urban level have not increased significantly in recent decades, the length of journeys has increased markedly. The volume of daily mobility has placed
heavy demands on urban and sub-regional transport networks. Urban Europe has grown rapidly over the last half century and will continue to grow; though the rate of growth is expected to slow towards 2050. In addition, we cannot simply think of mobility in terms of transport networks any more. The internet and social media channels are transforming traditional concepts of mobility. All of the important factors listed above that people value in their travel mobility are now being transferred to the new ‘virtual mobility’. For every purpose for which a trip can be made, there is now a virtual substitute; be it space for the development of relationships and friendship networks, gaming for leisure activities and so on. To many experts, this is not a process of substitution, but a broadening of mobility options, leading to a further expansion in the volume of both physical and virtual mobility. Virtual mobility is now the primary driver of lifestyle development in Europe, having profound impacts on how we travel to meet activity needs; and how we receive the goods and services we need.

What is of growing concern to experts in many fields, from environmental psychology and psycho-analysis, through sociology to economics and the planning arena, is whether the pace of mobility growth and innovation is happening too fast for individuals and society at large to absorb. This is something observed in the 1970s (the pre-internet age) by the American author Alvin Toffler in the book ‘Future Shock’.

**Climate change is fast, but social breakdown is much faster.**

Mobility can have diverse impacts within society. People’s identities and the growing gap between those who have high mobility, and those who do not, are becoming threatened by the power of the mobility explosion: leading to defensive actions in the form of xenophobic types of behaviour and community unrest in the neighborhoods’ of many European cities.

**Virtual mobility is now the primary driver of lifestyle development in Europe.**

The continuing mobility revolution, by its very nature, will have differing impacts on different groups in society. Most people in society suffer some form of mobility disadvantage (either permanent or transitory) as they pass through the life cycle. This will be due to dependency (among the very young and old), frailty (as a result of age or physical disability), gender role, low income, faith or ethnicity or sensory and mental impairment. These factors are not limited to mobility but affect the whole lifestyles of people afflicted with these conditions. Mobility disadvantage is most acute when these factors combine in any one individual, family or community. Where these mobility disadvantages become compounded in particular neighbourhoods, then they can give rise to social breakdown (The very definition of the word ‘the mob’).
How much mobility is there?

Quite apart from the scale of mobility in people’s minds, the expression of mobility across Europe has reached explosive proportions, putting further pressure on already congested transport networks from urban to international, and increasing the demands for new types of mobility products and services. Work within the MIND-SETS consortium has assessed the scale and nature of this growth, which is presented in detail in the sister document. As a result of this work, we can identify the key dimensions to physical mobility in Europe.

- **Mobility dominates lifestyle.** In 2012, there were 6,391 billion passenger kilometers undertaken in Europe, 82.4% of them being made by road. The level of road transport in 2012 was at the same level as in 2004. European citizens travelled an average distance of 34.7 km per day. Private households in the EU spent 13.0% of their total consumption on transport-related items, and the transport sector accounted for 4.8% of the EU GDP (EUROSTAT 2014).

- **Local trips dominate over long distance trips.** Road trips over three hours in duration represent only 12% of the total trips made between ‘NUTS3’ regions in Europe. Roughly 70% of all of the road trips made in Europe take less than 2 hours to complete (TEN-CONNECT 2009).

- **People are travelling further and further.** Communication technologies are already impacting on mobility both by substituting trips (e.g. because of email, teleconferencing) and by inducing new trips (e.g. due to enlarged relations supported by ICT). The net impact is difficult to assess, isolated from other social, economic and technologic drivers but on
a long-time perspective this may increase personal and business mobility patterns (COMPASS 2013).

- Mobility levels could change independently of economic performance with urban mobility becoming more stable. The aggregate demand for passenger travel developed roughly in line with per capita GDP and population growth in the past, but there are signs that this trend could be weakening in advanced economies, especially in relation to passenger mobility in urban areas (OECD ITF 2013). Mobility policy is proving more efficient in urban areas (for example in response to policies for road pricing, vehicle taxation and parking regulation).

- East-west migrations with EU enlargement will continue. Between 2004 and 2011, after enlargement of the EU to Eastern European countries, about 1.8% of the population in new Member States moved to western European countries, raising the host country population by 0.3%. Thirty million eastern Europeans moved to other European countries between 1997 and 2008. Transitional restrictions in place diverted workers away from traditional destinations like Germany towards more easily accessed labour markets in the UK, Ireland and the Mediterranean (Holland et al, 2011).

- South-North migration has increased due to the economic crisis from 2008. Over one million have emigrated from Mediterranean countries to other European countries. For example, in 2014, of all immigration into the UK from other EU member states, the predominant flow was from Italy and Spain; not from Eastern Europe (EUROSTAT 2015). Despite the extent of the 2008 crisis, south-north migrations have been generally one order of magnitude lower that east-west migrations in the 2000s, indicating low levels of labour mobility within western European countries (CEPS 2014).

- North-south migrations linked to residential tourism and retirement will continue to grow. The proportion of elderly people in Europe is expected to continue rising to 20% of the overall EU population in 2050 and to 30% by 2060 (EUROPOP2013). The older generation has become keen and frequent travellers, having both purchasing power and leisure time (Frye 2015). For example, in 2009, there were almost 0.5 million foreign residents under the age of 55 years living along the Spanish Mediterranean coast and in the island regions. Most of this migration has been from North West Europe, plus Norway and Switzerland. This older niche European immigration represents 1.6% of the total overall population in these regions (Rodríguez et al, 2010).

- North-South tourism on the rise. The leading tourist economies in Europe are France with 84.7 million visitors in 2013 (the global leader), Spain with 60.7 million, Italy 47.7 million, Turkey 37.7 million, and Germany and the UK with 31 million each (UNWTO 2015). The expanding numbers of tourists are a challenge both for transport networks (especially airports) and for social accommodation of larger volumes of tourists concentrated into the top tourist destinations. Northern European countries have a larger trend towards international tourism within the EU, whereas Mediterranean countries, to a much higher extent, take vacations within their own countries (Torkington, 2012).

- Migrations from outside the EU. 33.5 million people who resided in the EU in January 2014 had been born outside of the EU (6.6%). The largest numbers were found in Germany (7.0M, 8.7%), the UK (5.0M, 7.8%), Italy (4.9M, 8.1%), Spain (4.7M, 10.1%) and France (4.2M, 6.4%). Main routes into the EU have moved eastwards from Spain in the 2000s to Italy and the Eastern Mediterranean currently. However, most migrants living illegally in the EU originally entered with valid documents via EU
airports but then overstayed on a visa. On the other hand, emigrants from the EU outnumbered immigrants in 2014 in 12 countries: Bulgaria, Ireland, Greece, Spain, Croatia, Cyprus, Poland, Portugal, Romania and the three Baltic States (Eurostat 2015).

- **Decreasing car ownership in Western Europe.** After rising almost continuously since the end of the Second World War, the rate of increase in car ownership in Western-European countries has started to decline, especially in cities. This trend of ‘Peak Car’ started before the onset of the crisis in 2008. To many professionals, this new trend suggests that it was being caused by lifestyle changes, rather than economic stringency (EUROSTAT 2015). To others, it is still uncertain as to whether the Peak Car phenomenon denotes a fundamental change in people’s value sets toward their mobility. In some countries, the economic crisis and extremely high youth unemployment have played a role in postponing the purchase of cars. Also, deliberate policy measures to discourage car use in urban areas are also thought to have played a role in decreasing car ownership where it has been observed.

- **In the former communist countries of Eastern Europe,** car ownership is increasing rapidly, albeit from a lower base than in Western European countries. The drive to purchase a car mirrors the increase in post-war mobility freedoms that characterized Western Europe in the 1950s and 1960s. As a consequence, public transport patronage is falling from the high level of use that it had prior to the 1990s. High status is given to personal car ownership and to company car ownership.

- **Increased preference for rail travel.** The proportion of all trips undertaken by rail is generally greater in central Europe than in other parts of Europe; Switzerland 18%, Czech Republic 17%, Austria 15% and Hungary 13%. At the other end of the spectrum, peripheral countries, especially smaller ones or countries with geographical constraints rely less on rail to meet mobility needs: Greece 2%, Ireland 3%, Portugal 5%, Finland 6% and Spain 7% (EUROSTAT 2014).

- **Use of ‘shared’ or ‘accessible’ mobility services.** Economics is becoming less about ownership and more about access. Younger generations are becoming less interested in purchasing their mobility and more interested in renting and sharing it (Hajkowicz, 2012). Across Europe in 2014 there were almost 5 million members of car-sharing schemes, popularity being significantly higher in Germany, followed by France and the United Kingdom (STATISTA 2015).

- **Use of shared mobility solutions - bike sharing.** There are currently more than 500 cities in 50 countries hosting bike-sharing programs. Prominent cases in Europe include Paris, London and Barcelona, with more than 6000 bikes available in each city (Wikipedia 2015).

- **International mobility between European countries is still very limited.** Less than 5% of all trips and less than of 10% of all trip kilometers are for trips that cross European member state borders. Cross-border mobility between neighboring regions on 2 sides of a political border is even more limited; below 1% of all trip kilometers made (TEN-CONNECT, 2009). Low border permeability also affects economic activities, despite the European single market for goods being in place already for 30 years. Services represent 75% of the aggregate GDP of the EU, estimated at approximately 9 trillion Euros in 2011; but less than 0.7 trillion of this is traded across EU internal borders, 7.4% of the trade in services (Santagostino, 2012).

- **International travel in Europe is still dominated by holidays.** Just over 1 in 5 of the passenger kilometers travelled for holidays are
international. Of all passenger kilometers travelled for business, 13.3% are international. Trips to visit friends and relatives between member states represent only 5% of the total passenger kilometers travelled for that purpose; and only 2% of commuting passenger kilometers travelled in Europe was across international borders (ETISplus 2014). Visiting families is expected to increase with the number of economic migrants making more frequent trips to the home country; taking advantage of cheaper air travel for example.

- **Air transport is dominated in Europe by domestic connections.** For equivalent trip lengths, domestic flight are likely to have up to 50% more demand than international flights of equivalent distances within the Union (for example, despite Lyon and Bilbao having similar demographics and both being located 600km from Barcelona, air passenger flows between Barcelona and Lyon are only 60% of the size of air flows between Barcelona and Bilbao) (EUROSTAT 2015). This effect is caused by the “cost of European borders” and/or the “cost of gaps in European integration”.

- **Daily cross-border mobility is greater in central Europe, highlighting language, cultural and historical heritage.** Approximately 40% of the formal cross-border regions in Europe in 2003 were German speaking (Perkmann, 2003). Mobility between these regions is more prominent than between other regions. The ‘hot spots’ of cross-border mobility in Europe (that is, the number of people working in a neighboring region of another EU country) mainly concentrate around German borders: such as the Benelux countries, France, Switzerland, Austria, and in other central European countries like the Czech Republic or Slovakia). The largest cross-border flows are into Luxemburg, Basel, and the city cluster of Aachen-Liège-Maastricht, Saarbrücken, Strasbourg, Geneva, Lille, Copenhagen-Malmö and Vienna-Bratislava (ESPON METROBORDER 2010).

- **Increasing permeability for extra-EU borders.** Passenger flows between cities within the EU and elsewhere in the World are growing faster in many cases than are the flows between cities in different European countries. Within Europe, the largest flows remain the primary domestic inter-city movements within countries: Barcelona-Madrid, Paris-Lyon or Milano-Rome. However, out of the 10 busiest international city-pairs, 6 of them are between European cities and cities outside the continent (mostly between London and American or Asian cities). Proportionally by distance, Asiatic and American traffic is larger from London airports than traffic to EU destinations; African traffic is larger from Paris, and Latin American traffic from Madrid (MIND-SETS based on EUROSTAT 2015).

Europeans are hungrier to realize and take advantage of their mobility freedoms. The growth in mobility in the last 20 years has been of explosive proportions and the projections are for this to continue on all transport modes; from international to urban movements. We can identify 4 dimensions to the increase in European mobility:

- **Inter-city and international business and leisure mobility is underpinning economic growth in Europe.** The reliance of the Mediterranean economies on annual flows of tourists from Northern Europe and wider afield is marked. This has boosted the growth and capacity of regional airports and seaports. The continued expansion of the single European market has increased movements between the major European cities. This accelerated growth in business travel has, in turn, increased the demands on the major airport hubs and high speed rail networks.
Trans-European economic and retirement migrations are producing a new level of regular international mobility from the adopted to the home country. This has been assisted by the expansion of ‘low cost’ flights in the air sector; although it has increased mobility on all Trans-European networks, road, railway and sea crossings. In turn, the primary nodes on Trans-European transport networks in cities combine with increases in local mobility to create significant bottlenecks to movement.

The interplay of the different mobility dimensions on the lifestyles and life goals of Europeans has been transformational since the turn of the millennium. While the expression of mobility freedoms is undoubtedly positive, the issues remain of how to manage it, how to make mobility growth environmentally sustainable, and how to ensure that everybody benefits from it.

- A dichotomy between the de-concentration of congested mobility from the largest cities into wider city-regions with rapid growth in inter-regional movements in some countries (assisted by high speed regional and inter-city rail connections); while in other countries, the marked differences between highly mobile cities within low mobile, less developed regions remains.

- The catalyzing impact of virtual mobility through the internet on the volume of physical mobility across Europe, increasing the level of business and personal contacts exponentially; leading to the need to convert virtual contact to face to face contact.
4. How do people make mobility decisions?

Rather than the broader perspective of mobility outlined above, past developments in mobility thinking (the ‘professional mind-set’) have almost exclusively focused on the travelling environment and on predicting how people decide when, where and how to make individual journeys or, to a lesser extent, ‘chains of trips’. The first theory on this subject was born as early as 1930 with the Reilly ‘gravity model’, subsequently developed within the first American transport studies of the 1950’s, to predict the flows of vehicles between origins and destinations of differing sizes (and therefore with different gravitational pull). Such models developed during the 1960s, when the influence of mathematics and the scientific model to understand human behaviour became the dominant intellectual force. Since the late 1960s, we can identify a clear number of strands in thinking about the process of mobility decision-making. Each strand brings a different aspect to the subject:

- **Travel time.** Initially, it was thought that mobility decisions were a simple trade off of travel time between different modes. Decision making was rational and these trade-offs could be input into (disaggregated) transport models to predict how people would make their journeys.

- **Cost/ travel time.** Travel time was assumed to have a cost allocated to it. This enabled cost benefit analysis to be undertaken and investment decisions made on this basis.
This led to the concept of ‘generalised cost’ formulae. The relative balance of different factors in the generalised cost formulation was derived from surveys of travelers.

The idea that whatever the underlying processes influencing travel decisions, people did have thresholds when they would trade-off time, cost and other aspects of the journey experience - ‘stated preference’ models.

A further development emphasized that you could not understand the rationale of trip decision making on the basis of generalised cost. Travel decisions were made by different members of society, each with their activity demands in time and space. Understanding the choices and constraints people faced in linking activities in time and space would explain mobility decisions to a greater extent than generalised costs.

Life-cycle stages. The incorporation of life-cycle stages. In this proposition, people moved through different life-cycle stages, each with its own distinctive activity pattern. Significant changes in mobility occurred at certain ‘life shock’ moments, often between stages. Within each stage, it was felt that people were comfortable and more in control with habitual travel decisions than with volatile travel environments requiring constant re-evaluation of travel conditions.

In this proposition, given the belief that people’s mobility showed strong habitual tendencies resistant to change, there was the need to first isolate those people who show some willingness to change, and then focus attention on trying to influence their travel decisions. This was first formulated as ‘Realistic Choice Theory’, which became ‘Individualised Marketing’ and matured into Personalised Travel Planning. The basic emphasis here is that people ready for change may be unaware of the mobility options available to them. The provision of customised information acts as the stimulus for behaviour change.

Despite our knowledge of travel behaviour, attitudes to mobility and mobility trends, our ability to predict the likely public response to new mobility innovations remains limited. In current practice, a significant (non-commuting) part of travel behaviour remains unexplained.

Over the years, a number of techniques have been devised to better understand travel decision processes to better predict (and model) what might happen in the future. These techniques have drawn from a variety of disciplines; initially from Newtonian physics, through mathematics and statistical modeling and latterly through inputs from the social sciences. Such techniques have been developed to help calibrate transport models, based on household travel surveys, to predict likely mobility flows in the future; or to predict likely changes in behaviour arising from specific planned changes in the mobility system.

In the following sections, we document the various perspectives on mobility, as seen from the eyes of experts in different disciplines. Each one brings new insights into the mobility arena and building blocks with which to formulate the MIND-SETS approach. The journey opens up new innovations by mixing disciplines, emphasizing new perspectives and questioning whether the traditional variables we use to understand mobility are still the most relevant ones. The next sections examine the evidence as to how people make mobility decisions. In this process, we move from decisions made on a fully rational basis...
to those made using general rules of thumb. The extensive review work undertaken enables us to isolate the factors that drive the mobility decision-making circle – from purchase to use, to re-evaluation of options and motivation to change.

The dimensions of a mobility mind-set
5. Neo-classical interpretations of mobility decisions

The real and perceived monetary costs of mobility are a critical factor in:

- Decisions to purchase, share and use mobility
- Decisions as to where, when and how to travel

The economist’s perspective on mobility assesses how choices are made – how different aspects of cost are traded off to make final decisions. These choice theories are modelled to attempt to predict future behavior; for example the reaction to a new mobility system or product in the marketplace. The so-called neo-classical economic approach has traditionally dominated the economic analysis of mobility behavior.

In mobility decisions, cost is but one element of a host of factors that influence the mobility related choices we make. So the issue becomes how to weigh up the relative importance of costs against other factors in the decision process.

For most economic decisions that people make in life, neo-classical economic theory is felt (by a broad range of economists) to be an appropriate gauge, reflecting the choice process. This broad conclusion we reflect on later in this report.

This can either be done by simply measuring the costs of a mobility choice and then qualitatively weighing these against the other factors that we think will
influence that choice; or we can make the assumption that each aspect of the mobility choice can have a monetary value assigned to it that can be incorporated into an overall monetary calculation. The classic example in the mobility context is the value assigned to travel time.

Overall social welfare refers to the level of prosperity that can be achieved - the standard of living. While we can measure the monetary costs and benefits of mobility choices, can we put realistic monetary values to the other factors influencing mobility (such as the costs of time lost in travelling, accidents and so on)? If this is possible within limits, then we can calculate whether a mobility investment has an overall social value above the straightforward financial return. This is the basis for social cost benefit analysis which still forms the bedrock methodology for the host of investment choices made by planning authorities and the financial donor agencies in the transport sector.

The last half century has seen a wealth of intelligence, both theoretical and empirical research, assessing:

- The way in which neo-classical economics can explain the process of how mobility choices are made (and how this process is represented in, for example, transport planning models)
- The other factors and processes that should be considered in the theory and what rationale exists to balance these other factors against costs in economic choice modeling

These two lines of thought are not unique to the mobility field, but exemplify debates across wider areas of economic investment.

This search for a wider economic rationale to explain mobility choices has produced many insights into how mobility choices are made, and whether they can be modeled. In this process, economics has crossed paths with some of the other dimensions of MIND-SETS; in particular psychology and sociology.

These insights provide intelligence that can inform on how to understand how mobility decisions are made; and how they can use this understanding to influence mobility decisions for policy purposes or to maximize market take-up.

**Economic theory is based on concepts of welfare and utility.**

Specific issues, deriving from economic models of mobility choices, have significant impacts on the transport planning sector, as they affect the validity and reliability with which transport movements can be modeled and predicted into the future – be they models at a local level for urban travel modes, to strategic national or European models that include inter-city rail, waterborne modes and the air sector.

Transport models involve a merging of concepts from neo-classical economics and Newtonian physics. More ‘powerful’ places attract more trips than less powerful ones, in proportion to the cost of moving between them. A ‘professional mind-set’ has evolved in the transport planning profession around the use of the traditional ‘4 stage transport model’ in which people’s decisions to travel and to use different modes (termed trip generation and modal split) have used economic theories of choice. These models have attracted concern over their accuracy in predicting mobility behavior into the future (see for instance Timms 2008). While criticism includes factors relating to the structure and legitimacy of the model itself to address both infrastructure projects and more local sustainable mobility packages, it is seen to be weak in incorporating the plethora of contextual factors that influence mobility decisions.

At the European level, transport models of inter-regional and international travel follow the same model logic as for urban mobility models; based on generalized costs. Due to the cultural fragmentation of Europe, models need to
increasingly focus on the traffic generated at the global level, i.e. flows between European and the largest World metropolises; complemented by diffusion models that work at the Member State level, rather than extrapolating European patterns by aggregating from regional level models. European level transport models need to introduce “cultural” or “political” factors into their generalized cost functions to better take into account the “cost of the gaps in EU integration” (see below).

The value and use of such models to planning practitioners in Europe, and how this tight planning process could broaden to include a new MIND-SETS perspective is the subject of specific review and assessment work within the MIND-SETS project and the findings of interviews with practitioners. This will be documented in a further report (MIND-SETS, 2015b). In this report, we focus attention on what can be learned from the economic rationale for mobility choices.

Let us first look at the behavioural basis underlying neo-classical economics. The cornerstones of the neo-classical approach are captured in 2 terms: methodological individualism and rational choice. Individualism assumes that individuals make decisions in isolation, based on their preferences set against the constraints that exist to certain choices being made. Social behaviour patterns are therefore merely the aggregation of individual behaviours – there is no social interaction.

Economic rationality assumes that individuals are aware of all of the possible choices and their combinations. This knowledge allows them to make logically consistent choices. Like individualism, people’s preferences are assumed to be stable over time and independent of the preferences of others, or of the context in which the decision is made.

Translating this into the transport context, the relevant concept is that of ‘generalized cost’ (see Ortuzar & Willumsen, 2011). This is a measure that combines all of the negative elements of a journey – financial costs (including parking costs), the opportunity costs of time lost in transport or while waiting for transport, and the discomfort of travel (including safety). Trip choices based on generalized cost are assumed to have perfect information which allows for optimal choices to be made about their mobility – what transport mode is used, the vehicles purchased, the time of travel and so on.

The values people place on different elements of mobility choices are estimated, for example from stated preference surveys. These surveys are based on the premise that ‘everybody has their price’ where they trade-off different aspects that influence their choices in combinations of scales. In this way it is possible to show the threshold at which a person trades off the importance of one choice factor over another. In tune with neo-classical economic theory, each choice made is an individual one, but if you ask enough people the same question, then a broader ‘crude social’ thresholds can be identified using the statistical distributions of choice responses. These results can be calibrated against what people actually do (so called ‘revealed preference surveys’).

There is now a large wealth of intelligence in the development of ‘discrete choice models’ (Train, 2009), developed from generalized cost assumptions. These are used either to input data into transport planning models (estimating the trips generated by different modes between origin-destination pairs) or in stand-alone models (such as models of vehicle choice and residential location choice).
6. Mobility choices made in uncertain situations

6.1. Modelling mobility choices that lack certainty

One of the problems with the neo-classical approach to mobility planning is its denial of the possibility for economically ‘irrational behaviour’. To address this issue, economists have tried to modify the decision-making assumptions, currently based on utility theory.

People do not have perfectly processed information to make optimal travel decisions.

‘Hybrid choice models’ (see Bolduc & Alvarez-Daziano, 2010 and Chorus 2012) have been developed which integrate ‘discrete choice models’ and ‘latent variable models’, ‘taking account of the impact of variable attitudes and perceptions on the decision process’. As a result, perceptions and attitudes are incorporated. Models are estimated by combining observed choices (to indicate utility for the individual) and survey data for attitudes and perceptions. A range of data intensive, hybrid choice models have been developed which enable concepts such as habit, ignorance, beliefs, attitudes and social norms to be incorporated into the utility based economic model of behaviour. It is felt that
by incorporating these aspects within traditional utility functions, we can more accurately represent the more ‘qualitative’ aspects of mobility decisions.

The influence of cognitive psychology is clear in this strand of model development. Perception variables measure the cognitive capacity of the individual to represent and evaluate the attributes of different alternatives. Perceptions are relevant because the choice process depends on how attributes are filtered through the belief systems of each person. Attitude variables also measure the individual’s evaluation of importance that they assign to the features of different alternatives.

A second important development is that, to make a firmer link between behaviour patterns and mobility demand, the emphasis in research modelling shifted from models based on the trips people make to models based on the activities for which trips are made: thus emphasising transport as a derived demand and taking place within the constraints of households. Activity based travel demand models aim at predicting which activity is carried out, where, when, for how long and which transport mode is used to get to the desired location (see Rasouli and Timmermans, 2014).

Activity-based models allow for the assessment of the interaction between transport and non-transport policies or technological developments. They provide greater flexibility and versatility to represent the spatial and temporal dimensions of behaviour. They enable a dynamic element of behaviour to be addressed; that is the impact of decision A on subsequent decisions B and C, where, for example, unforeseen time savings trigger short term adaptations in travel behaviour.

In practice, activity models are data intensive, computationally demanding and are therefore not (yet) widely used in mainstream planning practice. Few fully and explicitly integrate household decisions in their activity-travel schedulers, and operational practical applications (such as the ALBATROSS model) are exceptional.

6.2 Behavioural economics

How do people make choices in situations of uncertainty? While there is evidence that people do not behave according to standard economic rules, which alternative approach would be the most appropriate way to mirror these decisions; or indeed to apply them? Additionally, people do not take decisions in isolation. For example, social factors (such as peer pressure in choosing a car or sharing a travel mode) have strong influences on mobility behaviour. People also take mobility decisions that have explicit temporal dimensions to them. For example, how much importance fuel costs are given in decisions to purchase a car? A great number of travel related choices are made in conditions of uncertainty.

Is the underlying theory of behavioural economics set to “puncture” the underlying economic theories in traditional transport models?

Many argue that the behavioural foundations of neo-classical economics are simply wrong reflections on the way people actually behave. Attempts to refine the inputs to such models with proxy behavioural variables in discrete choice modelling deny the underlying faults in the basis of the theory itself. This is the relatively new school of ‘behavioural economics’. These more recent approaches try to integrate intelligence on behaviour from psychology and the wider social sciences.

The empirical validity of neo-classical economics as representing a model for behavioural choices has been the subject of some long standing controversies. A primary criticism is that people possess only a finite amount of attention and
knowledge available – they simply cannot consider all of the alternative options and possible outcomes of decisions they may make: this is known as bounded rationality.

In the terminology coined by Herbert Simon, a ‘boundedly rational man’ (as opposed to a ‘rational economic man’) satisfices, rather than optimises (see Gifford & Checherita-Westphal 2008). In this theory, people have aspiration levels which modify with experience. Possible choice options are compared with this level (not all alternative options); ignoring those aspects of reality that appear irrelevant. In this way, the satisficer uses rules of thumb (heuristics) to economise on his cognitive resources.

Innovation in this field has come through the work of Amos Tversky and his colleague Daniel Kahneman. This emerging field is called “behavioural economics”.

Behavioural economics is becoming applied in mobility research and has a number of key areas of innovation.

6.3 Rules of thumb – heuristics

Heuristics is an approach to problem solving, learning or discovery that employs a practical method not guaranteed to be optimal nor perfect, but sufficient to meet the immediate goals – a rule of thumb is a behaviour by which a person solves a problem (Cartwright, 2011). There is a wide range of heuristics, many applicable to mobility related decisions.

A premise of behavioural economics is that, because the world is complex, people use rules of thumb to make decisions, rather than optimising each decision based on perfect information (Thaler and Sunstein 2008). Most of the time such rules of thumb are sensible but sometimes they can induce people to act against their own interests.

We can see a variety of choice situations where heuristic behaviour occurs (see Cartwright 2011 and Thaler and Sunstein 2008 for general discussion):

- Anchoring: where a person’s choice is unduly influenced by a benchmark value or norm.
- Priming: where the posing of a specific decision-context influences the choice made – for example, getting consumers into a specific mood with words and images that influence decision outcomes.
- Availability of experiences: when people assess the likelihood of risks by asking themselves how readily examples come to mind (the more salient the examples, the more the concern). This affects risk related behaviour.

Behavioural economics acknowledges that neo-classical economics remains relevant for most of the decisions people take in life; but it also claims that there are some areas (including in the field of mobility behaviour) where behaviour deviates in a predictable and systematic way from the postulates of neo-classical economics.

- Representativeness: where people judge how likely that A belongs to category B. People answer relative to their stereotype of B, which could be inaccurate.
- Optimism and overconfidence: people show unrealistic optimism and overconfidence regarding their own potential and performance level. This leads to risk taking, particularly relating to life and health risks. It
also prevents people from taking preventative measures (e.g. driving behaviour). There is also no evidence that overconfidence decreases with experience.

- The endowment effect: people value more highly goods they have some ownership over. They also dislike losing a possession more than gaining it in the first place. A value is therefore not static but the effect of valuing possessions is a stronger inertia to making changes that may be in their own interest.

- Status quo bias: habits are those behaviours we conduct frequently without thinking, irrespective of the seeming irrationality of the behaviour. One possibility to change is by targeting people at change points in their lives when lifestyles and mobility are re-evaluated. Changing habits involves a lot of cognitive effort – diverging from the automatic pattern of thinking and behaving that requires little cognitive effort. People are reluctant to engage in effortful thinking, a point underlined also by psychologists.

People tend to stick to the current situation. If the cost of looking for new alternatives is too high and the expected gains too uncertain, people will reuse their past solutions to make behaviour easier and less risky. Habit produces general reactions such as reduced mental and cognitive effort. Inertia is strongly present in transport; particularly in mode choice (see Innocenti et al. 2013): For example through the symbolic and 'affective value' of cars. They decision to buy or use a car (or not) may start out as an analytical process. However, repeated exposure to a pool of mental signals which emphasise the benefits of cars can change the decision, whereby the initial process becomes a heuristic and not an analytical one.

This bias is also relevant for choice of service provider, after the mode is chosen (Paha et al. 2013). Also, a substantial proportion of people do not take the shortest route (Di et al. 2014), but take routes within a boundedly rational threshold: the same is true of departure time choices.

**Individuals show a marked preference for cars in laboratory experiments, even when against their economic interest; and show resilience to change. Information on alternative modes is not properly processed, cognitive efforts remain low and rational calculation plays a limited role – this would suggest that strategies to reduce car use would be better addressed by command and control strategies than by soft policies on information provision.**

How are habits broken (Garling and Axhausen 2003)? How does decision-making revert to being more deliberate and rational? People who have to account to others for their mobility decisions do use more attributes and available options (Aarts et al. 1997) – with more consistency in thinking. Temporary structural changes may have a disruptive impact and produce a change in behaviour and this impact can be prolonged if people have to justify the context of trip decisions (alternative modes if they planned to use the car) (Fujii and Kitamura 2003).

The emergence of multi-modal travel information may reduce inertia to change; but only if the information demonstrates reliability (Chorus and Dellaert 2012): an issue we return to in later chapters. In the longer term, the experiences built up over time build up expectations and beliefs that influence future behaviours. The conclusion here is that this longer term dynamic is subject to considerable inertia, only responded to by a change in car availability, household location and so on.
Framing: In this concept, choices depend on the way in which the problems are stated or conceptualised by the individual. This could potentially be used to enhance the way people evaluate the choice attributes to promote more sustainable choices.

Mental accounting: This is the process of coding, categorising and evaluating choices and outcomes. Things are put into separate accounts for separate purposes. And people are reluctant to move money between accounts. For example in the 1970s, it was empirically observed that people had fairly stable time and money budgets for travel.

The section above has described a number of different types of heuristics that are relevant to the mobility context. The differences between the types of heuristics are often subtle and one single phenomenon can be explained by several competing types (Hamilton et al., 2014). It is important to understand how the choice and the context in which the choice occurs are related. For example, it will determine whether messages (campaigns or plans) to influence behaviour are seen in a positive or negative way. Once schemes are implemented, the acceptance of the measures can be unexpectedly high – familiarity breeds acceptance. As a result, if mobility has been reduced, despite loss aversion, the affected decision maker may well accept the unavoidable scheme and change their reference point.

6.4 Competing economic theories relating to mobility choice

6.4.1 Prospect theory

In the Prospect theory (PT) of Kahneman and Tversky (Kahneman & Tversky, 1979), two stages of decisions are anticipated. An initial ‘editing phase’ describes the process whereby people organise and assess all of the prospects of a decision and set a ‘reference point’ as an expectation. This reference point is usually the ‘status quo’.

Based on empirical evidence from heuristic research, losses are weighted more than gains and weightings tend to overweigh the small probabilities and underweigh the large probabilities – it is asymmetric. This contrasts to conventional economic theory which values gains and losses equally and subjective probabilities conform solely to objective probabilities.

Prospect theory and conventional expected utility theory share assumptions that individuals make independent decisions in a self-interested manner;
maximising the utility of the choice made (Van de Kaa, 2010). However, they differ in that Prospect theory emphasises that people’s preferences are dependent on the context in which the choice takes place, the way choice options are presented; and the way the individual perceives them. People frame their choice options in terms of the degree of change they expect to generate from the aspiration level they have defined (i.e. the prospect); rather than on their prediction of the final choice outcome.

The actual predictions of Prospect theory are highly sensitive to the definition of the reference point (see Hensher 2012). Yet there are few obvious candidates for relevant reference points in mobility. Perhaps we can think of acceptable ranges of travel times or route diversions. However, for car purchase, it is unlikely that the purchaser will have reference points for each attribute; rather that they perceive the ‘general good impression’ of all attributes. Regarding trip decisions, reference points can be highly related to individual circumstances (for example the stage in a trip chain). Reference points can be influenced by the perception and evaluation dependent on the nature of the information presented (Avineri, 2011). It is also difficult to know what the alternatives are that the person is evaluating and therefore impossible to value (Van de Kaa, 2010).

Empirical evidence of prospect theory is largely based on gambling experiments with two simple prospects (Timmermans, 2010). In the mobility world, travellers have many more options – uncertainty can arise from unfamiliarity, travellers are not aware of alternatives nor of the outcome of uncertain events – incidents, queues and congestion. Perhaps Prospect theory should only apply to decisions made in risky situations that involve the potential of losses that cannot be reversed, and not to decisions with (relatively) minor consequences such as route choice and departure time.

One of the primary criticisms of Prospect theory is that it ignores that people experience the consequences of their decisions, and can adapt their behaviour to influence the outcome (Timmermans, 2010; Avineri, 2012). Therefore it is important to understand how travellers learn and adapt in an uncertain environment, for varying degrees of awareness, information levels, and belief strengths.

6.4.2 Other economic theories

Rank dependent Expected Utility theory (REU)

This theory extends expected utility theory by incorporating the empirical finding that people overweigh small probabilities and under-weigh larger ones (Quiggin, 1982). It uses this as an assumption to reassess the probability functions in the classical choice models.

Disappointment theory

In this theory, the utility of the outcome of a decision is measured relative to a prior expectation of what the utility would be.
Regret theory
In Regret theory, losses and gains are valued in comparison to what the outcome would have been if the best alternative had been chosen (Loomes & Sugden, 1982). This implies that alternatives with average performance on all attributes would be more popular than alternatives with a range of high and low attributes. If an alternative is already performing well on one attribute, further improvements will bring small rewards. However deterioration of below average attributes will bring large losses.

6.4.3 Conclusions on the relative performance of different economic models

- Compared to the satisficing heuristic rule, expected utility theory, prospect theory and regret theory all assume that people use decision mechanisms that require high cognitive efforts. So none of these theories incorporate the possibility that people may use simple decision rules (such as rules of thumb).

- An important disadvantage of prospect theory is the lack of consensus on the appropriate reference point in the travel behaviour context. This model requires estimating a large number of parameters.

- Expected utility models and regret theory models are easier to understand than prospect theory models.

It is concluded that, from a practical point of view, for the modelling of large scale transport networks, expected utility theory still provides the best framework to model and investigate traveller’s behaviour (de Moraes Ramosa et al. 2014).
Mobility from the psychologist’s perspective

Individual well-being is a product of society. All societies induce both illness and well-being. In turn, every community shapes and defines what is considered normal (and by default, what is abnormal). The definitions of social deviation have consequences for how stressed and detached people can feel in their environment relative to others. In the current social order, society lambasts those who are seen to be deviant more than benefiting those that meet social norms – the economic model of society is heightening feelings of social disparity. The current health norm in society is success that is financially and materially visible. The mobile and virtual environments are the perfect channels for expression in this respect. Cortisol (the stress enzyme) measures highly in very mobile societies.

7.1 The psychological function of mobility

What we have learned from the work attempting to qualify classical economic theory through the application of heuristics, is that it is not so much the objective elements that define mobility choices but people’s perceptions of them.

Psychological factors such as attitudes, values and beliefs influencing mobility decisions can be predicted. These factors form the perceptual filter through which we see the environment around us and interpret it: why we behave in this way, and not that way.

So from the psychologist’s perspective, mobility has a psychological value in the same way as the economist apportions an economic value. Psychology has many dimensions, from cognitive, or physiological, psychological to teleological behaviourism. The former concerns itself with internal mechanisms...
of the mind and representations of it. Teleological behaviourism, by contrast aims to explain, predict and control overt behaviour, including the complex patterns that form our ‘mental lives’. This latter branch of psychology apportions emphasis to the influence of the surrounding environment and context on mental life. Cognitive psychology, by contrast, emphasizes the inner functions of the mind, with decisions independent of their environmental context.

**Psychological factors such as attitudes, values and beliefs influencing mobility decisions can be predicted.**

Psychological research emphasises that personal well-being depends heavily on fulfilling three key psychological needs: autonomy, competence and relatedness:

- Autonomy – the freedom to explore the environment freely
- Competence – feeling in control of things and capable of accomplishing goals
- Relatedness – having social support mechanisms around, connected to the world through social ties

Well-being requires all three psychological needs to be satisfied. They should not conflict although they do reinforce each other. Not possessing these three needs leads to negative emotional states and diminished well-being. This is true for individuals, neighbourhoods and societies as a whole.

In the MIND-SETS project, we find that mobility plays an increasingly important role in determining the achievement of these psychological needs. Mobility promotes freedom and autonomy, it promotes relatedness through providing access to social life, and prevents isolation and alienation; and finally it promotes competence in achieving goals and gaining control. So it follows, in most cases, that people or areas which measure high levels of mobility will have a higher quality of life than those who experience low levels.
7.2 The psychology of sustainable mobility

How can we better understand and predict the psychological factors that influence our mobility mind-sets; for example in leading to people adopting more sustainable ways of travelling; or more sustainable ways of living in general?

The solution to this question lies in the ways we behave ‘normatively’ and ‘hedonically’. Psychologists argue that our behaviour patterns are guided by three primary goals: hedonic, gain and normative goals:

- **Gain goals** – individuals focus on whether they gain finances, status and power from a particular way of behaving

- **Hedonic goals** – individuals focus on whether a particular way of behaving would take undue effort, be costly and too difficult for them. So hedonic behaviour only occurs when it is fun, easy and not costly

- **Normative goals** – people should engage in ‘doing the right thing’; the costliness of behaviour is ignored

So given the diversity of these 3 goals, we can foresee 3 different types of behaviour arising from one situation. Resolving the conflicts between these goals is similar to economic choice models in mobility economics, trading of the pros and cons of different behaviours with a psychological rather than economic framework. Two solutions are foreseen to resolve the conflict between the 3 types of goals:

- **Making sustainable mobility less threatening for hedonic and gain goal achievement** – making mobility more fun, easy and less costly

- **Strengthening the normative goals to do the right thing, pushing hedonic and gain goals into the background**

We can see both strategies being used in sustainable mobility policy development. For example, let us take initiatives to change behaviour by promoting soft mobility modes or reduced mobility prices: the aim here has been to ‘break the car habit’ and develop positive associations towards using public transport. However, the results in many cases show changes only in the short term. Providing hedonic or gain incentives to get people to change to a more sustainably mobile lifestyle ‘overcrowds’ the intrinsic motivation and has the opposite impact of strengthening the extrinsic motivation to act in a normative way.

To achieve longer term changes to encourage safer and more sustainable behaviours, the important strategy to pursue is to keep the normative goals active: people believing they are doing the right thing.
The perceived costs and benefits of engaging or not engaging in such behaviour might affect our willingness to take it up. Economists have detailed the diversity of cost items involved in mobility decisions (financial costs, time, effort etc.). A low cost hypothesis would conclude that people will only take up sustainable mobility modes if the perceived costs are low. While people can switch from car to softer modes on short trips, they seem reluctant to forego the comfort and privacy of the car space. Socio-cultural factors also play a role; for example the greater likelihood of taking up cycling in the Netherlands; where it is more normative.

Preferred mode of transport is a status symbol for some social groups; particularly car ownership, as private mobility possesses a utilitarian function, but also a self-expressive function. Research has shown that, alongside the functional elements, motives for car driving were symbolic and affective elements – cars are seen as prestige and higher status. In this context, making alternative modes attractive is problematic.

People showed that the instrumental aspects of electric cars were more important in the decision process to buy ‘a car’. However, symbolic and environmental aspects were more important in the purchase decision of a ‘specific car’; which was clearly linked to gaining status within the ‘environmental’ peer group to which the person wants to attach to; particularly as an early adopter. High status and prestige are key motivators for mobility. The same is true for the adoption of new technologies in general, ‘signalling’ status.

7.3 The psychology of space and place perception

A fundamental element of mobility is space perception. Here we look at the interface between the spatial disciplines, architecture and psychology. Emerging technologies in the digital age will have great influence on the urban environment and urban form we experience in the future. How will our mental lives map out onto this complex physical and increasingly virtual space?

People in different parts of Europe will perceive the same psychological barriers differently, due to different cultural settings.

Environmental cognition refers to the awareness, impressions, information, images and beliefs that people have about their environments. This implies that individuals not only have information and images about the existence of these environments, but they also have impressions about their character, function, dynamics and structure – instilling in them meaning, significance and mythical symbolic properties. (Willis, 2007).
What happens between buildings matters more than it once did – design research now builds a conceptual framework for new media urbanism and a concern for the ambient character of spaces. For perception of space to be meaningful, there is the need for people to identify with their surroundings – an awareness or ‘sense of place’. New technologies have created new layers in the urban environment.

The mental mapping of spaces is essential for efficient orientation and mobile skills (Lahav & Mioduser, 2000). As notions of physical space become increasingly informed by the fluctuating boundaries and data transmissions of wireless technologies, new layers in the urban environment have been created.

We can imagine a ‘digital skin’ layered over tarmac and concrete (Brunet, 2010). Maps of emotions and memories are inextricably linked to the map they overlay, in the same way behaviour relates to its environment. Traditional maps favour showing the street over the route, the static over the temporal and the formal over the subjective. In addition, our traditional points of urban reference also shift (Sant, 2006).
8. Mobility, social identity and social change

8.1 Sociological and anthropological perspectives on mobility

As social animals, the basis of our mobile lives lies in the balance we develop between our conflicting fundamental desires for autonomy and control, and the desire to find attachment through bonding in social groups – and that, in this balancing act, our mobile lives have important mental, physical and virtual impacts. The value sets which we express in our mobility have strong norms relating to the current European social model, the legacy of previous social models and social norms which reflect the diversity of European culture. These factors will generate different mobility mind-sets across Europe, but mind-sets which may have a single explanatory DNA running through all of them.

_You cannot live for yourselves. A thousand fibres connect you with your fellow-men; and along those fibres, as long as sympathetic threads, run your actions as causes, and return to you as effects._

Reverend Henry Melville, 1856 (Quoted in Pinker, 2014)

Our relationship with our mobility therefore revolves around our relationships with others. The interplay of these ‘social’ factors with psychological and economic factors is of course a central theme. The mobility decision-making process; whether it is a decision to change and purchase, or rent a particular type of mobility, the purchasing decision moment itself or the mobility experience, all involve social influences. These influences include the freedom
mobility provides relative to others, our social status, the personal and power relationships we develop, or those that influence us, how we project an image or personality of ourselves within society, and how we judge our performance and experiences relative to others.

Sociology also has its roots in anthropology and the study of man as a social animal. To the sociologist, social and individual desires are represented as the influences of social ‘Structure’ and ‘Agency’ (i.e. the decisions made by individuals). There have been three primary strands to sociological development (Collins, 1994). Firstly, society could be seen to operate as a functional organism, comprising norms and institutions which drive the overall social body forward (for example in the work of Emile Durkheim). Secondly, theorists such as Karl Marx stress the internal social conflicts that can naturally arise among different norms and institutions within the society, engaged in a ‘struggle’ over valued resources. Thirdly, sociologists such as Max Weber argued that society is nothing more than the shared reality that people construct as they interact with one another.

Sociology has traditionally focused on what we might call ‘vertical mobility’. That is the movement of people up and down a social hierarchy; based on power and status relationships between individuals and groups, and between groups. The Mobilities movement, and a long tradition of social geographers, emphasize that it is impossible to fully understand social processes without understanding their spatial relationships. In addition, mobility has a central role within anthropology; the social territories we generate, the kinship structures that support us and the role of migration. In this way, we see parallel developments in sociology, psychology (from the strict cognitive to behavioural psychology) and economics (from neo-classical to behavioural) – each one strengthening the role of what the early geographers called environmental determinism – something that has always characterized anthropology.

They are casting their problems at society. And, you know, there's no such thing as society. There are individual men and women and there are families. And no government can do anything except through people, and people must look after themselves first”.

Margaret Thatcher in an interview in Women's Own in 1987

When we start to develop a MIND-sets approach to understanding mobility, it is important to be aware of the social model in which we live. The last 30 years have seen a radical change in the social model across Europe. For example, Margaret Thatcher in 1987 proclaimed that ‘There is no such thing as society’.

There are two primary forces driving modes of thinking in general (but also in mobility policy and planning) – the scientific model and neo-liberalism. In both models, society appears on the fringes. In the scientific model, which has dominated our thought in all disciplines since the mid-1950s, social norms and forces are treated as externalities; largely because they are difficult to measure. It is easier to measure individuals and then aggregate them to some form of social statement. This approach has been common within the transport planning profession.

While Neo-liberalism on the surface emphasizes a ‘healthy’ respect for individual freedoms relative to the state, the model is also problematic in placing the free market at the centre of social development; through the promotion of individual well-being in a competitive society (Achterhuis, 2010). The traditional responsibilities and obligations that people felt towards the community (going back as far as the ancient Greeks) have now switched to the
In the modern world, the building and maintenance of social networks involves not only physical travel but also technology-mediated contact. As virtual interaction continues to expand, more emphasis is now being placed on the need to retain face to face contact. Social networks are no longer place to place but person to person.

‘Social capital’ is a term to mean the amount of social interaction you have in daily life – essential for building and maintaining your social network, meeting both social and informational needs. Social links lead to information exchange and the adaptation of people’s preferences and behaviours, including travel. They also meet the desire of an individual to interact with members of their network for leisure activity. In the context of urban development for example, transport technologies increased urban decentralisation and dispersal. This led to the spread of new types of social networks, less embedded in the local close knit networks and lifestyles that marked societies in smaller cities and villages.

### 8.2 Mobility and increasingly complex social structures

“The modern individual grows up in a highly unstable environment in which almost everything is attainable, the only thing being that you have to consume. The snag is that you have to engineer your own success; if you fail, you must be either lazy or sick.”

Paul Verhaeghe, 2012

The increasing pace of social change is breaking down traditional family and social ties, weakening kinship and dependency structures and changing social roles, for example between the genders (rising divorce rates and multi-parent families being two of the most predominant changes). Traditional explanatory variables of behaviour patterns are becoming less and less relevant. In turn, accelerating social change is increasing the complexity of social spaces and how people perceive the physical/virtual world they live in: increasing the cognitive load required for living. People now exist and move around within a myriad of different peer groups, each of which can exert social pressure or a particular norm for behaviour; and can also provide reward and enhanced well-being. We have moved from the traditional to the urban to the virtual village for kinship and dependency.
In addition to the significant impacts of the reduction of traditional family and kinship structures in society, the impact of internet communication has been transformational. We can now identify 3 interlocking worlds in which people exist – the physical, the mental and the virtual. It is possible to see people travelling and texting, while listening to music or the radio on headphones. Although the activity is taking place while walking down the street, the individual prefers the virtual world to the physical. This behaviour has quickly become ‘social’.

Within modern society, it is not sufficient to understand mobility purely through expressed mobility, in terms of patterns of trips or web-sites surfed. The perception of the freedom that your mobility is giving you is of fundamental importance to the manner and competence with which you interact with others – it can provide positive self-esteem and mental well-being, it can provide negative self-imagery and assist mental decline. Multiplied over whole communities, mobility freedoms provide a critical and pivotal element between community development and community breakdown – between inclusion and exclusion.

The modern complexity of people’s activity spaces (regular and occasional) in physical and virtual space and of their much wider awareness spaces makes the conceptualization of people’s mental maps almost impossible in the modern age.

Social networks, as documented elsewhere in this report, are now a combination of the physical and virtual worlds; fusing to generate new mobilities. The new ‘sharing society’ is a good example, and here I distinguish between the so called ‘accessible society’ (shared common services such as car or bike sharing, or public transport) and the ‘sharing society’ in which I share my mobility. In traditional close knit communities which still exist across Europe, sharing is part of daily life. I will give a lift to that person because they are one of us, they are known.

The ‘hill people’ and the ‘valley people’ of the highlands of Papua New Guinea are now extended to the artificiality of the built environment – the ‘village people’ of Brooklyn; and the now emerging virtual environment of internet communities.

The confidence inspired in close knit rural communities is less common in urban social networks but is being rejuvenated through new types of trust that people place within new internet communities. Particularly popular among the new digital generations, the old concept of sharing is revived. Lift-giving through smart phones is one example. However, is the type of sharing and trust that is developed in close-knit communities the same as that being observed in mobility sharing schemes? Like primates, we naturally share the things that are most important for survival. Humans try to achieve this natural sharing through the various forms of economic and social system operated; and through moral codes of conduct. It is also true that we like to share. The act of sharing releases Oxytocin, the bonding hormone, into the body and increases feelings of well-being. It also provides an incentive to protect the bond formed against other surrounding bonds. Sharing, so psycho-analysts will tell us, has socially desirable, though perverse, consequences. A car-pooling scheme may work in a close knit physical or virtual village; but not for a broader population. However, the solution to this may exist within the potential of IT mobility services.
The ‘social confidence’ for sharing in a wider Uber or car-pooling community is provided by the IT matching system that supports it - generating the perception of trust and security inherent in close knit communities.
9. Social influences on mobility choices

9.1 Mobility choices and group conformity

There are numerous ways in which social interaction affects economic behaviour in general and in transport. In the neo-classical model people’s preferences are independent of others but this is not the case in reality. Some decisions are made at the level of the group (for example, as shown by activity based scheduling between household members). People also compare with others when taking decisions or evaluating the consequences through 3 channels (see Abou-Zeid & Ben-Akiva 2011):

- People obtain information from others
- People seek approval from others
- Downward comparison may make one feel happier and vice versa and affect future choices

Research shows that conformity to group behaviours is very strong and conformity to agree with the views of others is also strong, even if the individuals hardly know each other (Thaler & Sunstein, 2008). This has strong impacts on choices. For example, collective conservatism can develop, even if the rationale for it becomes outdated: in addition, traditions persist because people think others like it. This point is particularly important in the success of transport soft measures (Sunitiyoso et al. 2011). Being a member of smaller groups produces stronger incentives than being a part of the overall population, as the feeling of belonging and responsibility within the group are
Conformity and social influence plays a large role in the acceptance of new types of vehicles

Using social influences can have a significant impact on the transport system, for instance by generating a critical mass of users that make the use of public transport modes on given routes viable (Dugundji and Gulyas, 2008). So we can say that models of mobility choices that ignore social influences are likely to produce misleading choice parameters. Most mobility surveys collect no information on social networks.

An important contextual element that might support or weaken one’s personal norms is the social norm. Two types of social norms have been defined; descriptive and injunctive:

- **Descriptive norms** – describe what most people do in a certain environment: thinking that the majority must be right (called the social proof heuristic). It can have both desired and undesired effects – encouraging conformity to the social norm, or strengthening the reaction to it.

- **Injunctive norms** – these only promote the desired behaviour. They inform people what they should do, and what might happen if they do not conform.

In situations where the (morally correct) injunctive norm is violated, then the descriptive norm appears to be the most accurate predictor of behaviour – norm abiding or norm violating. In the case of norm violations, situational cues are important to reinforce the norm (for example, speed warning signs).

Conforming behaviour that says, ‘well if that’s what people do, it must be right’. In contrast, other social norms that say ‘this is what you should do’ and ‘this is what will happen if you do not’.

Our mental lives are entwined with our social lives and ‘social norms’ are strong influences on the formation of our beliefs, values, perceptions and attitudes - these social forces can have positive and negative outcomes.

9.2 Mobility gives image and positive self-esteem

Mobility gives image. Your possessions and behaviour in society provide a ‘projected personality’ and your ‘identity’ (defined by others, not by you). This can either be done in the form of conforming your behaviour to that of the group (with bonding and protective advantages) – accepted fashion or social expression; or through individual expression as a fashion innovator and initiator of a new group – social experimentation.

The expression of your lifestyle is through your appearance, your behaviour and the possessions you have that support them.

Once mobility becomes privately owned, it becomes a possession and the reasons for purchasing and using it go far beyond the simple function of getting from A to B. It takes on a highly useful, mobile expression of your projected...
Where mobility possessions express higher relative freedom, then they are socially powerful tools. Car ownership is of course the primary example, a dominating factor defining differences in social status between people. In this context, the hormone testosterone and socio-sexual competition in the traffic environment is more predominant than the release of Oxytocin, sharing and bonding. In many social peer groups, peer group pressure expects a certain level of mobility from you; resulting in your group acceptance or your marginalization.

Perhaps this pattern, still dominant, is changing through new generations of digitally empowered people.

Expensive mobility possessions, providing status and power could be being replaced by the status and power achieved through purchasing the latest new laptop or smart phone, ‘applications’, or through the content and power of your Facebook page – perhaps a far safer environment to express your competitive edge.

Public transport, in countries where the aspiration for car ownership is strong, is seen as ‘poor person’s mobility’. However, in the new digital world, public transport is the perfect environment for self-expression through appearance, and for displaying your connectedness with the new society through smart phone and laptop use – at the bus stop, in the airport, on the train and so on. Of course this excursion into self-expression hides the huge intrinsic value that mobile devices bring to extend the time for socializing, for leisure, and for working.

Mobility possessions (or lack of them) play a major role in projected personality to peer groups.

Mobility can be used in conversation to lay down relative status (and power); and therefore to command respect from people and peer groups. People meeting for the first time pass signals to each other to establish relative status. While in the past, one’s occupation may have been the first signal to pass on, in
the modern world, these signals are more likely to emphasize mobility freedoms, mobility status, and strong IT connectivity.

**In the new world, your peer group may not demand a high performance car from you, but they will demand high performance connectivity.**

The exchange of mobility experiences is also a primary subject of dialogue. Of course, this should not be surprising, given the increasing volume of mobility for leisure and business travel; but it serves to re-emphasize that mobility is more to a person than actual movement. This is essential intelligence to those planning and designing mobility products and services. It is something that psychologists in the car manufacturing sector have been working with for years, but which now needs to take the foreground with all stakeholders in the wider mobility economy.
Mobility deprivation and social change

Paul Verhaeghe, the eminent psycho-analyst states (2011) “To sum up, never before have we in the West had it so good, and never have we felt so bad”. Additionally, it is clear that market based societies operate on the ‘trickle down benefits’ principle, which over time exacerbates the differences between the ‘haves’ and the ‘have nots’ – social conflict theory. In this context, mobility has been no exception. The situation has been further exacerbated by the economic crisis since 2008; which was itself caused through applying the excesses of neo-liberalism. Reinforced on this market-based model for social development are the accelerated changes on society brought about by the internet revolution – providing fast, personalized, customized and automated services; generating a new baseline for social development, providing new channels for personal expression and individuality. So roles are changing: citizens have become consumers and internet contacts are redefining ‘friends’.

Despite the current focus on the mobility issues surrounding the lives of the millennial generation, it is important not to forget that the primary demographic change is population ageing; and therefore an increase in frailty, dependency and disability. As the previous section has documented, the primary mental disorders are loneliness and detachment; plus depression, agoraphobia and addiction. While many older people are ‘blooming’ in new healthier lifestyles, promoted through greater mobility, the very old require mobility support to retain the important social connectivity they need.

Customised mobility solutions exist for these groups of mobility impaired persons – paratransit solutions (Pickup, 2014). The ageing baby boomers, currently experiencing a healthy mobile lifestyle, will get older and demand society’s support with their mobility, as their family support networks decline. The point of giving up the car, of using slippers as the main footwear, we know
to be points of mental change in older persons. Ironically, the very types of ‘demand responsive’ mobility designed for the disabled and elderly over the last 50 years will go mainstream, as younger generations call for customized, automated and seamless mobility choices.

In previous work on the mobility component of poverty (Pickup, 1988), journeys defined as ‘shopping’ and ‘personal business’ to older people are important for social and bonding reasons; and not the category specified. Another common purpose not in the coding list but of essential importance to older people was the regular visit to the cemetery to pay respects to departed loved ones – often in inaccessible locations on very large sites. John Urry (2007) also picks up this point about what he calls the ‘invisible patterns of mobility demand among retired persons: “Elderly users describe their journeys as ‘just’ for shopping, research identified many other ‘needs’ that people had; visit a spouse in a care home, visit friends, go to a café, attend a community centre, art classes, to get to work or to go to the pub – this range of what it is that the otherwise ‘excluded’ are trying to access may only be revealed through new infrastructures that ‘realise’ such latent demand”.

10.1 Low mobility feeds social tension and breakdown

The self-perception of low mobility feeds social tension and threatens breakdown: clinical psychologists underline that powerlessness and helplessness are among the most toxic emotions. Inequality leads to a loss of respect, including self-respect – in psychological terms this is the worst that can happen to anybody. In recent years, depression has doubled and people see it as a personal failure in the new social order. Responsibility has increased as has the level of guilt in failure, which, if multiplied across a community can be toxic.

Whether we judge that the mobility freedoms used by individuals to attain power and status in social peer groups is ethically desirable; it is nevertheless a strong force in society. It is particularly strong force where the people perceive themselves as losers in the process, not winners.

The explosive growth in mobility has only served to exacerbate the difference in life chances between ‘low’ and ‘highly’ mobile groups.

The negative feelings for the relative minority with low mobility are essentially stronger than the impact of the positive signals enjoyed by the more highly mobile. For low mobile groups, restricted mobility freedom at the social scale may be felt in the development of low community self-esteem. This leads both to negative forms of social reinforcement within the excluded community, manifesting in increasing xenophobia; and an increase in antisocial reactions in the form of radicalized behaviour – particularly where the community can build mobility discontent into a wider sense of exclusion; for example the exclusion felt by different ethnic or faith groups, women, the poor, the dependent and the disabled.

There is a strong spatial element to mobility social exclusion, particularly prevalent (though not exclusively) in peripheral neighbourhoods or regions, where the impact of low mobility combines with low accessibility to create social tension. The book, ‘The Spirit Level’ analyses countries with more equal and unequal societies (measures by income differentials) across a whole diversity of social and epidemiological factors. The powerful results demonstrate clearly that the more equal the society, the less the incidence of these factors. In this context, mobility is no exception.
"We're sitting between two worlds (second generation immigrants not accepted in society). We're stuck." It's been 30 years that we've been caged into the suburbs," said Senhadji Djouad, a 19-year-old medical student.

"It was bound to happen one day or another. "You wouldn't believe the conditions that we live in" he continued. "We have rats. The pipes are old. It stinks. And remember, you're only 20 minutes from the Champs-Elysees. The only thing that separates us is the ring road."

The widening and marginalization of the gap in Europe between the ‘mobility haves’ and the ‘mobility have not’s’ is a cause for concern and an issue that has to be tackled at its roots to combat social tension and promote inclusion in the broader society without unnecessary ‘Ghettoisation’ and radicalization.

10.2 Mobility as a positive force for social change

Mobility stakeholders are able to contribute and set an example for social change in the society at large.

What we can conclude in a more positive light from the above discussion is that mobility is a powerful force for social change. For example, recent work in Egypt by the lead author (Pickup at. al., 2015) addresses the appalling frequency with women are routinely sexually harassed in the travelling environment; an expression of the wider problem of women’s position and lack of opportunities in Egyptian society as a whole. The national railway company, as part of a large investment plan, are implementing a full gender mainstreaming programme, combining a mix of physical, ITS, enforcement and education measures to improve women’s safety and security in the station and train environment.

1 Excerpt from an interview with Darren Foster, Freelance journalist reporting on the Paris suburban riots of 2005.
This example in Egypt is a good indicator of what mobility policy can achieve through the appropriate cocktail of investments.

In addition, much has been achieved in the past 50 years in addressing the specific needs of physically, sensory and mentally disabled persons. While much remains to be done, customised vehicles, fully accessible design, transport staff education and training, demand responsive transport services have transformed the life chances and self-esteem of disabled persons. What is ironic is that the provision of personalized and customised mobility services for marginalized groups in previous decades has become the new mobility objective for all in 2015. Personalised, customised and automated mobility are the new trends and the achievements in this field started with the pioneers developing services for the least mobile in society in the 1970s.

**Mobility remains image and efficiency, as it has done for the last half century; but its nature is radically changing as social structures change in a combination of both physical and virtual worlds. Communication accelerates the pace of all of the mobility social forces discussed above and therefore accelerates the need for mobility policies and for mobility products and services in the marketplace to work to combat exclusion while meeting society’s hunger for greater mobility freedoms.**

The driving force of change cannot be found in the behaviours on any specific social dimension – gender, occupation, social class definitions etc. – but in the value sets of each generation; particularly the younger generations raised with the digital age in their blood.
11. Mobility that reflects my values

People develop sets of values

Value’s, to the psychologist, are defined as one’s guidelines in life, that function as the guiding principles – influencing our thinking, decision-making, attitudes, motivations and behaviours. Values can trigger different types of goals: for example a person with ‘biospheric values’ (concern for all things environmental) would trigger normative goal behaviour (such as sustainable living). Families who have biospheric values approve of policies to reduce car use, in contrast to those who possess egoistic and hedonistic values. These patterns have been shown to be common across cultures from Europe to South America and Russia.

The Value-Belief-Norm Theory predicts behaviour through personal norms. These are defined as one’s feelings of moral obligation to act in a certain way. It is further strengthened by the feeling that behaving in this way makes a contribution to the greater good. Attitudes and beliefs play an important role in the process by ascribing responsibility and awareness of the consequences. Beliefs can be further predicted through values. In other words, values lead us to think in a certain way, which will, for example, credit or discredit the importance of sustainable behaviour, which, in turn, makes us aware or unaware of sustainability problems; which finally influences the way we claim responsibility for those problems. As a result, we develop a strong or weak personal norm to the problem. Personal norms seem to be the key in predicting behaviour, so strategies should aim to make the desired behaviour the norm – for example by strengthening the biospheric values of individuals.

12. Mobility that reflects the values of my generation

Value sets among different generations of people

Generations have specific, well observed and research-fine-tuned features, authenticating them as a ‘specific, timeline-related generation’, but generations can’t be (a) ‘mutually exclusive’ or (b) immune for influences from other socio-cultural, psychological, biological and economic variables.

- The different generations aren’t separated by massive brackets; the closer a birth year is to the “borders” of an assumed generation, the more likely the person will be affected by the identikit of the adjacent generation.
- The use of generations in mobility futurecasting can nevertheless be very useful in setting the scene for further, multi-layered research.

For example, within the scientific field of psychology, ‘general psychology’ (what is the impact of being obese on one’s self-esteem?) is the precursor of ‘differential psychology’ (what is the impact of being obese on the self-esteem of introverted versus extraverted people?).

Let us examine the value sets of current generations, based on ground breaking work in the fields of product and service innovation in industry. Like previous sections of this report, it provides new insights into mobility and the interface between technical and service innovation into the mobility marketplace and the social and psychological forces that shape our decisions and lifestyle across Europe – now and in future decades.

“We are more a product of our generation than we are of our parents”
13. Digital Aboriginals

The generation born after 2000

13.1 General characteristics, attitudes and behaviour

People born after 2000 (15.4% of the population) are very different from others generations as they have grown up with a very different relation to technology. This generation is also referred to as Generation I, ‘Screenagers or generation ADHD (Any Devices Head Down)’. For kids who are fifteen years old or younger, technology became a sort of augmented layer on top of reality that is permanently accessible for entertainment, communications and support during planning or executing tasks. Technology is not something you switch on or off. For Digital Aboriginals, digital is permanent, much like oxygen. Growing up with this innate understanding of, and close relationship with technology, their attitudes and behaviour regarding mobility, will also be different from previous generations.

- Digital Aboriginals are constantly asking themselves: ‘Where can I go to play, and who’s up for a game?’
- While their parents developed their abstract thinking skills mainly in middle school, Digital Aboriginals undergo an accelerated development in terms of cognitive intelligence, reasoning, autonomy and sense of self through interactive media and games.
- Every parent of young children today will witness how intuitive and effortless kids are handling tablets, games, social media, smartphones, etc. No generation before has been more tech-savvy than the Digital Aboriginals. Today 69% of parents consult their children about which ‘Digital Aboriginals don’t play by the rules; they want to create their own worlds.’
products to buy and 49% of parents rely on the knowledge of their kids when choosing electronic devices.

- Instead of simply participating in the digital world as it is offered to them, Digital Aboriginals want to get their digital hands dirty by messing around with the building blocks. Since 2012, 35,000 kids in the UK have joined so-called ‘Code Clubs’. Code Clubs are volunteer-led after school clubs where kids aged 9-11 learn to code programs and games in playful, collaborative and intuitive ways.

- No other generation has ever been raised in an atmosphere where openness, transparency and sharing of private life events are common practice. In Britain, almost 8 out of 10 (77%) mums and dads are now ‘sharents’ who upload photos of their children to social networks and entertain their ‘audiences’ with the adventures of their kids. As a consequence, Digital Aboriginals are very image conscious. Their lives have been documented, often in great detail on Facebook and Instagram. This continuous confrontation with their image leads to a polarised self-esteem, which is either very high or very low.

- Digital Aboriginals grow up knowing that any service and solution is just a tap away (as long as their parents are on hand with a credit card). Tomorrow’s consumers will expect to be able to travel more, and move around more easily with ubiquitous solutions at their fingertips. They will consider the state of being ‘on top of things’ as the ‘New Normal’.

- On the other hand, the younger we go, the more consumers will expect technology to serve their emotional needs.

- Used to talking on Skype, Digital Aboriginals augment their conversations by sending relevant content to each other such as links and pictures or by music sharing and gaming. For Digital Aboriginals there is already a disconnect between “where they are” and “whom they work or experience things with”. Travel will not just be a physical thing. Recent and upcoming innovations in “computer-mediated conversation” will effectively simulate the idea of being in the same physical-digital places as your friends or colleagues. This way of ‘placeless being’, will be a natural habitat for the Digital Aboriginals.

- Digital Aboriginals are fickle, their attention span lasts about as long as a tweet.

- Having been exposed to shocking and violent images on the web, they are more aware than we give them credit for. Research shows that instead of becoming apathetic or being desensitised to violence, these images increase their empathy for real life situations and make them understand the difference between fake and real violence or abuse (the UK Council for Child Internet Safety interviewed 24,000 children in 2014).

- Digital Aboriginals are skillful strategists at navigating their parents. Since their hardworking and absent parents often suffer from guilt, kids quickly figure out how to make their parents listen to them.

- Girls are the new boys. Among Digital Aboriginals, gender roles are less defined. Young kids grow up reconfiguring the standard blue for boys and pink for girls.
13.2 Engaging Digital Aboriginals to new mobility concepts

Just like Digital Aboriginals prefer multimedia entertainment, rather than stand-alone toys, they will not accept that mobility and travel puts their life on pause, and is reduced to a logistic operation from A to B. Experience, play and socializing will have to be integrated and will be as much as possible core to the journey. New providers of mobility will have to find ways to make the physical experience better through (big) data technology.

*Digital Aboriginals will grow up ‘being on top of things’, with the help of digital technology. For them, control over mobility will always be something that starts in their hands or in their pockets (or at the speed of thought, who knows…)*

*Mobility will be experiential, immersive, enriched with technology and about much more than the functional going from A to B.*

When targeting Digital Aboriginals, new providers of mobility will have to put their younger generations of end users in the driver seat. Products in mobility will have to be designed to be disrupted. Digital Aboriginals will want to master their own experiences in non-linear ways in order to adjust, enjoy and create their own journeys.
14. Millennials

People born between 1985 and 1999

When we refer to Millennials (17.4% of the population), we are talking about young people born between 1985 and 1999. These days, they are between fifteen and thirty years old. Other titles that more or less refer to the same generation are Generation Y, Generation D or the ‘Digital Natives’.

14.1 General characteristics, attitudes and behaviour

Millennials are the most contradictory generation and most problematic generation to grasp for both marketers and employers. There is no generation that is more likely to use smartphones, be connected on social networks and buy online. According to a global survey by chip maker Intel, 86% of Millennials say technology makes their life simpler and 69% say it enhances their personal relationships. Yet 59% feel that society relies too much on technology and 61% say that it dehumanises us.

Millennials are the most highly engaged with technology, but also most often yearn to run away from it. They shop online, but value shopping as a social experience the most. They love authentic holiday destinations, but will plan their trip together in a Facebook group. They want meaningful jobs that deliver a lot of social recognition, but value a good work-life balance and consider flexibility as the Olympic minimum. They are highly networked, but value face-to-face interaction and analogue social contact as the most precious moments.

“Millennials are the most highly engaged with technology, but also most often yearn to run away from it.”
When it comes to technology, we see that most successful Millennial applications are those that copy-paste the ease of digital technology onto real-world locations, actions, social events or emotional well-being. Millennials are well-educated, well-experienced and always in search of new experiences. They collectively suffer thaasophobia: the fear of things that meet expectations. Some call it the fear of boredom. When it comes to mobility, this generation demonstrates a sensational new attitude towards car ownership. The International marketing Agency Prophet conducted a European and American study about Millennial attitudes towards cars, and uncovered some surprising results:

- **One man’s waste is another man’s fortune!”**
- First and foremost, Millennials value authenticity. They want to be themselves, no matter what personal relations or work life demands. When it comes to work, they would organise their job as a second home, open to the world and with a serious sense of conviviality.
- When it comes to other generations, they relate to the Front End Baby Boomers the most (The protest generation who are now over their 60’s). They are good mentors with a lot of wisdom and experience to learn from.
- As traditional career paths fracture and disintegrate, Millennials are increasingly turning to other means of making a living: harnessing the power of social networks and sharing platforms, these youngsters are less eager to buy and possess, and more inclined to rent, swap, borrow and share.
- Of all the generations they are probably the most flexible generation. They like change, they lack a regard for common sense, authority and tradition, and they always see opportunities to make things better.
- Millennials value equality like no other. They are more easy-going, spontaneous, open-minded and accepting of diversity.

- Whereas their Boomer parents were (and are) using competitive strategies to upgrade their lives (and disposable income) in a secular, capitalist, post-war society, Millennials - raised in a new, re-mixed world (and family) order - understand that "reaching the next level" is better achieved through smart, agile collaboration (with peers), than through fierce competition.

**65% of Millennials state that the newest model of their favourite smartphone brand is of more value than the latest model of a fancy car brand.**

**More than two thirds (67%) agree that rather than buying a new car, they would buy a second hand car in order to spend more on consumer electronics and travel.**

The New Value seekers, as Millennial Mind-sets are often referred to, are active participants in the sharing economy, prone to use room- and car sharing services (think of Couchsurfing, Airbnb, Uber, Lyft, …) According to research agency Insites (2015) 24% of Western European Millennials - compared to 5% of babyboomers - has used or is likely to use a commercial car sharing service

- Unlike their parents, who draw a clear line between work and personal life, Millennials are increasingly embracing work-life blending – doing personal tasks in work time and vice versa (36% of the Western
European Millennials are most likely to mix work and life, according to research by Samsung At Work (2014)).

- Millennials - both male and female - are masters in swiftly adapting to different situations. They manage a 'repertoire of identities' (aggressive in sports, tender listening in romance, intellectual at work, ...)

- The ‘Quantified-and-Optimised-Self’ Generation Y or Millennials are keen to use wearable tech to monitor and enhance bodily and emotional functions and empower them for identification and gesture-based control of products and services.

14.2 Engaging Millennials in New Mobility

- When thinking of the brand identity of New Mobility Services, we should consider the Millennials as our primary target audience and create Millennial-proof concepts. First of all, because Millennials are the most flexible to adapt. On top of that, Millennials are considered as the guiding generation for Back End and Front End Babyboomers. For the first time in history, more mature target audiences enjoy to be inspired by the younger generations.

- More crucial even than brand identity, is to design the total product experience, reducing brain strain and effort from all possible touch points. The Mobility Service should be an on-demand service, including all the benefits of owning your own car, while having none of the risks and inconveniences.
15. The Prime Busters


15.1 General characteristics, attitudes and behaviour

“Prime Busters (20.7% of the population) are the Generation ‘Just not’ - Just not making ends meet, just not having enough time to relax, and just not having enough space – an ‘efficient and pragmatic mindset’.

The Prime Busters - often referred to as Generation X, Baby Busters, Generation Nexus or Generation Gap - represent people born between 1965 and 1984. These days they are between 31 and 50 years old. They value locally sourced products and services, community, and spend a lot of time looking for quality. Juggling school-age children and dependent ageing parents, they are relatively time poor, cash poor and often lack space to live. The Prime Busters are therefore referred to as the ‘Just Nots’.

- The Prime Busters pioneered the idea of working from home (sometimes because they had no job to go to), coming up with life/workspaces, the internet café, initiatives like “Bar d’Office” and project based work spaces.

- As working 9-5 is no longer the only way to make a living, many Prime Busters become ‘new value seekers’. They turn to other means of making a living. Harnessing the power of social networks, sharing platforms, they are using their reputations, influence and possessions to barter for the things they want and need.

- A strong force behind this shift is the collaborative economy in which transactions occur between peers. Previously unmonetised possessions
and activities such as the home, the car, cooking and driving become bastions of financial worth. Think of peer-to-peer platforms like Airbnb, Uber, Blablacar, Eatwith, etc. ...

- Prime Busters exist on the cusp of the technology divide, bridging the analogue and digital generations. Their behavior is a bit of both.

- A growing need to budget (as a result of both the recession and the actual reality of expensive housing and parenting) leads to a greater amount of trading up and trading down (= buying both expensive and cheap products as individual items are considered for their intrinsic and emotional value)

- The Prime Busters are hard-nosed pragmatists, realising that life is unpredictable and that they have to cope with uncertainty. We find proportionally the largest number of broken families among Prime Busters.

- Primers are more efficient, pragmatic, faster and better at decision making than other generations. On the other hand, they tend to avoid confrontation and prefer to react to conflicts with rational arguments rather than with empathy and emotions.

- Primers are continuously in search of a work-life balance. As most Primers are employed in the service and knowledge industry, they have the lowest time budget compared to other generations. Most are hard-working parents belonging to double-income families with growing children.

- Though they spend a lot of time on social networks, they are less keen to try out new things. As they have more established careers than Millennials, they are avid users of social media for professional purposes. Social networks like LinkedIn are very popular among Prime Busters.

- Busters are the prime "LATTE"-generation: growing up in a globalised, industrialised, digital, greying and overpopulated world, they start looking for sustainable answers by adopting (more) Local, Authentic, Traceable, Trustworthy and Ethical products and brands.

- Prime Busters have now entered the era of burn-outs, midlife crises and the search for self-actualisation.

- Prime Busters bridge the competitive generations (45-plus) and the collaborative ones (30-minus) and can often be considered as a generation that adopts traits of both.

- Revolting against the globalized excesses of the Baby Boomers, Prime Busters are more interested in getting together with family, friends and their local community.
16. Babybloomers

People born between 1955 and 1970

16.1 General characteristics, attitudes and behaviour

Shaped by the bust-and-boom Thatcher and Reagan years, the Back End Baby Boomers were born between 1955 and 1970 (21.5% of the population). This generation is also often referred to as the Baby Bloomers, Kennedy Boomers, Junior Boomers, or Generation Jones. They are currently 45 to 60 years old, and are known as a wealthy and adventurous generation. They see themselves as committed and competitive and feel younger than their years.

"Back-end Baby Boomers have developed into Babybloomers. They want to die young, but as late as possible."

“They desire to maintain personalised and long term relationships.”

- Back End Boomers came of age in the competitive eighties. The hyper-competitive business environment of the Yuppie eighties shaped them. Today their main concern is how to apply their influence and responsibilities.

- They are determined to have it all: youth, health, and a lifestyle that promotes happiness and wellbeing.

“Back-end Baby Boomers have developed into Babybloomers. They want to die young, but as late as possible.”
• When it comes to work, they are the calm pragmatists. They are digital immigrants that are easy to nab, because of their analogue accents.

• In terms of technology, the Back-End Baby Boomers are by no means laggards. They grew up in the pre-internet era, but, with a growing level of disposable income, they are willing to spend on technology. The tablet is mostly bought by the Back-End Baby Boomers.

• Bloomers are opinionated, pragmatic, determined and critical of brands. Their upbringing in the 70’s means that they place value on longevity, which is sometimes in heavy contrast with the fast changing high-tech industry and the model of built-in obsolescence.

• Most of them discovered use of social media through becoming friends with their children on Facebook, and they stayed connected and kept exploring from there. Grey Millennials try to be fellow travellers with their children. They are open and willing to listen to their recommendations. Millennial behaviour is very inspiring to them.

• Back-End Boomers are far less likely to post photos or status updates online than younger generations. They value their privacy and satisfy their social needs in analogue and real life contact and meet-ups.

• Unlike their predecessors (the Master Boomers) in the 60’s and the 70’s, the young Bloomers were confronted in the 70’s and 80’s with a crumbling economy. Restrained affluence tended to overestimate their physical potential (both in energy levels and bodily functions)

• When shopping, Bloomers behave most as show-roomers, using their smartphones to make online comparisons.

• 76% of male Baby Boomers feel more pressure to look good at work than in the past.

16.2 Engaging Back-end Babyboomers in New Mobility concepts

To connect with Back-end Babyboomers, any kind of mobility product-service provider should offer a personalized service that guides them through the service. They should not position the services as a one shot, or temporary experience, but as items and relations with lasting value, while using language that stands up to scrutiny.
17. Master Boomers

People born between 1940 and 1955

17.1 General characteristics, attitudes and behaviour

The golden generation of Master Boomers (also referred to as Front-end boomers, Senior Boomers or Marshall Boomers) is born between 1940 and 1955, and currently aged between 60 and 75 years old (15.7% of the population).

Master Boomers are crucial because they are ‘agents provocateurs’ in the development of the New Rules of Ageing, adding not only years to life but also life to years…”

They have reached the retirement age, and so they have an ocean of free time, and a lot of space and they are dedicated to spend money and enjoy their lives. They flexed their consumer muscles for decades, reshaping every aspect of our society to heir well-heeled tastes.

- Front End Boomers are instinctively rebellious. Their individualism, self-confidence and determination support them in not willing to conform to the stereotypes of middle age.
- They were the first generation to become the victims of symbolic consumption dominated by brands, logos, design, lifestyles and all kind of hedonistic temptations.
• Boomers are class, age and gender confused. They support the blurring of gender stereotypes and social classes, but with a restrained determination to remain youthful.

• Many Boomers plan to move to a livelier environment after they retire. They are attracted by the concept of so called “Yoghurt Cities” with an active and vibrant cultural life and restaurants and cafés where they can enjoy life.

• Through their buying power, spending behaviour and retirement status the Master Boomers will continue to dictate the development of entire fields of consumer products and technology in the upcoming decades. From self-metering devices, to keeping track of health and medication needs, to luxury editions of tablets, home automation and interiors that enable independent lifestyles. Independence is the lifestyle aspiration for older Boomers, and technology and services will be the tools that will help them hang onto it for as long as possible.

• Front End Baby Boomers demonstrate a paradoxical consumption mode. Masters start to spend unapologetically, but at the same time look for a more disciplined lifestyle (self-preservation) and care for nature (environmental awareness).

• Fashion, design and activities that allow Boomers to age without looking old have a huge potential.

• Front-enders adore getting along with Millennials, as the Generation Y attitude is inspiring and keeps them young.

17.2 Engaging Master Boomers in New Mobility concepts

Organisations talking down to Boomers are those who will lose the audience which currently holds the most wealth. Ergonomics are becoming increasingly important to ageing Boomers, who may be losing some dexterity due to arthritis and other medical issues. Crucially, they want to age well and maintain the levels of activity that they have managed to sustain so far. If you want to seduce people in their 60’s, make products to appeal to people in their 30’s. Appeal to active and adventurous lifestyles.

Service providers who want to appeal to Master Boomers should rely on two main brand scenarios: on one hand they can spread a narrative where Baby Boomers are the heroes. On the other hand they can provide design, applications and services that help Baby Boomers to age in the most elegant, active and independent way.
18. When generations meet with Interface Design

18.1. Generational perspectives on mobility choices: some key conclusions

The generational perspective on mobility, derived from a detailed assessment of the values each generation holds, has revealed important insights as to how they will respond to new mobility policies, products and services.

- Millennials will be pro, since they are natural born supporters of (digitally enhanced) smart urban solutions.

- Prime Busters: pro, since this time-starved (knowledge and service) generation is looking for time saving, smart traffic solutions; like the Millennials, this generation is in favour of collaborative/sharing mobility services.

- Babybloomers will have mixed feelings; on the one hand, they become irritated by aggravating car immobility in cities (and loss of time). On top of that, they are sensitive to the advice of their Millennial-children. On the other hand, the idea of car-sharing and bike-sharing or digitally connected modes of public transportation are habit-killers; forcing them to leave the mobile comfort zone of their own (50-plus luxury) car.

- Master Boomers, rather no than pro. More than Babybloomers, the Master Boomers are accustomed to owning a (personalized, luxury) car. For the older generations, their car still is an outspoken status symbol. Time loss is no hard argument for retired Boomers to start using intermodal car-sharing/public transportation services.

**Combining the generational perspective with the broad understanding emerging from previous sections, we can form a strong view of the wider role of mobility and how it is merging into new forms of lifestyle, harnessing new technology into a hybrid physical/virtual existence to achieve life goals—an existence where mobility holds a central role.**
19. Conclusions to Part A

The Mind sets project has a major objective to provide advice to mobility planners, policy makers, product manufacturers and service providers across Europe, from local to international and on all modes. It is essential in achieving this that we have cast the broadest possible disciplinary net over the mobility issue. The vast array of intelligence coordinated in this report; and in its sister report have revealed a mobility that has much wider impacts than movement – impacts that shape mobility decisions – factors related to deeper insights both into people’s personalities, and into the social environment in which behaviour takes place – and from which mental being is derived.

We have come a long way from the significance of mobility measured by the number of trips made. How do we try to make sense of this myriad of empirical and theoretical intelligence, into a single approach to provide advice to stakeholders – generating economic growth in the sector with sustainable and inclusive solutions?

Unravelling the issue of mobility mind-sets has produced an underlying understanding of the key issues and processes affecting the mobility decision-making process. What is necessary is to determine the extent to which the significant factors play out in different regions of Europe. For example, will the current drive for car ownership in those eastern member states, where car ownership was subject to restrictions before 1989, continue to be a force, or will the generational force for IT connectivity overtake it in all member states. It will therefore be necessary for MIND-SETS to apply advice that is customised to potentially diverse planning environments and mobility marketplaces across the continent.

We can see from previous sections of this report that there are four arcs of what can be envisaged as a ‘behavioural rainbow’, each ring revealing a series of
factors that, in combination, come together to define the role of mobility in our lives, and the way this whole dynamic is changing with the generations. Under the rainbow is the decision-making process itself – the motivation to change, the decision to change and the decision moment. In addition, we can distinguish between people of different cognitive capacities to navigate mobility decisions, in the same way we identify people’s physical capacities for movement, or for navigating virtual mobility systems.

1. Surrounding this we can identify the arc of ‘objective elements’ of the decision (e.g. the choice of cars or flights on offer; their comparative costs etc.). Economists have traditionally focused on the relationship between the first two elements in the neo-classical model. People are assumed to behave objectively and have equal ‘choosing’ abilities.

2. We now know that people rarely make rational choices (particularly relating to mobility) but that there is a perceptual filter of the factors, drivers and barriers influencing decisions. This second arc of the rainbow includes the acceptance of ‘uncertain’ decisions made using ‘rules of thumb’ or heuristics. Heuristics outlines patterns in the nature of this boundedly rational behaviour. People’s attitudes relating to communicating an opinion or to a decision moment, refer to the specific relationship between a person’s perception of the objective world and the next arc, a person’s more widely held values.

3. This third arc of the rainbow contains people’s more widely held value sets and beliefs – how these determine the goals people have, their drives and motivations in life in general; that will express themselves in the mobility world. Inside this arc, we can identify the powerful forces relating to individual – society interaction; expressed by different generations of people.

4. The final outer arc of our rainbow refers to the construct of our personality that interacts with society to produce our values and beliefs. This includes our cognitive capacities – there are rainbows of different sizes.

This simple, 4 level rainbow, enables us to see through the myriad of behavioural and choice factors that have been summarized in the vast literature reviewed for this report. Moving from the top arc to the centre,
personality to the decision process is ‘applying experience’. Moving out through the arcs is the *learning and adjustment* process from the experience of the decision. The overall outcome, or quality of the rainbow, is economic, physical and mental well-being.

We can see social influences on mobility within the third ring – shaping our values, goals and preferences in the world and, in turn, defining our personality - our identity as perceived by us or, more accurately, as defined by others in the society around us. There can be many models that could be suggested of this process, but we see the rainbow concept as simple to understand and communicate; and encompassing all of the material processed.

In Part B of the report, we look to the future, to the innovations in mobility and other items in lifestyle that will impact on it. We examine the pace at which industry is innovating products and services; and the rapid rate at which novel ideas are being absorbed by the generations.
Mobility mind-sets in a rapidly changing Europe
20. Physical, mental and now virtual mobility

Transport and ICT relationships

20.1 Physical and virtual mobility

The last 10 years have seen a rapid acceleration of internet based communication into everyone’s lives; having major social impacts. This is not just an accelerating trend but should be underlined as an explosive change on an historical scale – it will define future mobility. Information and communication technologies (ICT) have generated a shift from social groups defined through a specific neighbourhood or workplace to individually-based social networks – ‘networked individualism’ – personalised social networks and social ties (Wellman, 2002).

As a result, social networks have become less coherent and have less spatial definition – this will continue into the future. People will have more active social contacts than in the past; requiring more time for communication and these contacts transverse many social networks; which the technology will provide for.

It is important that we also recognise the relationships and impact of non-mobile technologies in homes, workplaces and other facilities on our mobility freedoms. We will no longer be able to think simply in terms of ‘trip related’ and non-trip related’ activities; they will act in unison with mobility as a defining feature of individuals, families, social groups and of national identities.

Mobility visions can no longer be separated into ‘physical trips’ and ‘virtual trips on the internet and other communication media’. The division between the two increasingly becomes blurred and we need to understand the whole picture if we are to assess mobility futures.

At the same time, the rapid transport networks are enabling long distance mobility and multi-localities to develop in more people’s lives – holiday homes, economic migration, long distance relationships and social ties. The appearance of virtual social networks such as Facebook, on the one hand and the changes in working patterns on the other hand have led to the mixing of leisure activities with other daily routines. All of these developments have an impact upon mobility behaviour. Personal mobility today therefore involves not just the movement of persons, but also of the objects they need; and the imaginative and virtual travel using ICT (Urry, 2000).

Many of the terms for physical mobility are applied to communications – traffic on networks, the information highway etc. The internet has changed radically our perceptions of accessibility by weakening the traditionally strong links between activity, distance place and time – this in turn is influencing the structure of our cities and regions.
20.2 Physical and virtual mobility interactions

Much work has been conducted into the possible substitution of ICT for travel, a possible complementary growth; or simple neutrality (Hjorthol, 2002; Mok and Wellman, 2007; Mokhtarian, 1990; Niles, 1995; Plaut 1997). Recent development are showing that the concept of a possible demise of transportation were premature. A ‘complementarity’ relationship has emerged whereby the increasing importance of telecommunications contacts may signal the growth in transportation needs and services. People who have more contacts travel more to translate virtual contacts to face to face contacts and therefore the social network grows spatially, requiring greater physical mobility.

The initial prospects for trip substitution have not happened. Relatively minor amounts of trip substitution have been lost in the overall aggregate increase in travel: stimulation has had the greater effect compared to substitution. The pace of technological change is making it difficult to unravel the dynamics of the process (Aguillera et al., 2012).

Mobile communications disconnect activities from specific locations, leading to increasing flexibility in location and timing and location of activities: mobility patterns are less structured and less predictable. This has made it even more difficult to assess travel decision processes; adding a strong new dimension (Couclelis, 2004; Dal Fiore et al., 2014; Kwan, 2007; Lenz & Nobis, 2007; Schwanen & Kwan, 2008).

There are two primary interrelationships between telecommunications and travel which complement each other.

- Trips that would not have taken place without the stimulus of telecommunications
- Where one increases the efficiency of the other (for example the impact of ICT on goods mobility and smart warehousing).

One major influence of ICT is the ability to manage and interact with the transport system in real time. Initially there was strong ‘top down’ development of sophisticated traveller information systems, using on-line journey planners – using what can be called ‘formal information’. However, the emergence of smart phones has led to technological developments from ‘bottom up’ user generated ‘informal’ information; for example combining cellphones with GPS technology.

The impact of all of this rapid change is more complex travel patterns embodied in new lifestyles with mobility mind-sets that emphasize personalised
The spatial spreading of social networks is further stimulated by telecommunications affecting:

- The quality of contact could have been reduced – fewer strong ties and more superficial ties
- The number of active contacts will have increased through the ability to maintain remote relationships, increasing the amount of free time available for social interaction; stimulated by the falling costs of telecommunications.
- People can be more selective and gain greater satisfaction from their social networks, as they are less dependent on where you live, work and play; and are more personalised.

The spatial spread of social networks is having marked impacts on the increase in leisure travel: telecommunications generating travel. However, the increase in the number of contacts and the decreasing strength of ties due to spatial separation may have affected the information flow through social networks. In the ‘weak ties theory’, weak ties generate novel sources of information. Greater selectivity in people choosing their social networks through ICT will lead to reinforced perceptions, attitudes and behaviours among network members. Selectivity may also reflect the desire to acquire new knowledge. All of this process has a vigorous dynamic over time as links are dissolved or reinforced and changing life circumstances influences social needs.

We can identify 3 impacts of social networks and ICT on travel behaviour:

- Direct impact of ICT – travel behaviour is changed as ICT is used to maintain social networks (Arentze & Timmermans, 2008; Axhausen, 2006; Larsen et al., 2008; Line et al., 2011).

- Indirect effect of ICT1 – ICT influences the amount of social interaction which, in turn, influences travel patterns (Axhausen, 2003; Carrasco and Miller, 2006; Schwanen & Kwan, 2008).

- Indirect effect of ICT2 – Travel patterns are changed by ICT use impacting on the relationship between social interaction and physical mobility (complementarity) (Tillema et al., 2010; Van den Berg et al., 2012).
Virtual mobility is mobility facilitated by networked computers. Virtual environments exist within computers. Individuals today and in the future will live in ‘multiple spaces’, incorporating, physical, electronic and virtual spaces – which will create numerous new socio-economic opportunities and challenges. Socially, the new virtual worlds represent the frontier of social media and social computing. In this context, every activity has a virtual substitute (Arora, 2012):

<table>
<thead>
<tr>
<th>No.</th>
<th>Types of space: drivers</th>
<th>Place as a metaphor</th>
<th>Virtual space</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Utilitarian</td>
<td>Roads</td>
<td>Information infrastructures, digital divide, online traffic, virtual communities, shared space, convergence</td>
</tr>
<tr>
<td>2</td>
<td>Aesthetic</td>
<td>Residences</td>
<td>Customisation, personalisation, ownership, taste, private versus public space</td>
</tr>
<tr>
<td>3</td>
<td>Context</td>
<td>Parks</td>
<td>Cyberleisure, social network sites, situated activity online, gendering online space, online pluralism.</td>
</tr>
<tr>
<td>4</td>
<td>Play</td>
<td>Playgrounds</td>
<td>Engagement, interactivity, corporate blogging, work-play, hard play, gaming</td>
</tr>
<tr>
<td>5</td>
<td>Value</td>
<td>Museums</td>
<td>Emotion, affective spaces, nationalism and online tourism, digital flaneur and browsing, politics of information.</td>
</tr>
</tbody>
</table>
21. Seamless mobility, third places and vending machines

MIND-SETS AND THE NEW MOBILITY OFFER

The concept of mobility has evolved in recent years into a ‘holistic mobility lifestyle’. At the heart of the drive for human mobility is the desire to live, think and act individually.

Technology is opening up new innovation in products and services in the mobile environment. Outside of the immediate mobile environment, technology in buildings is also having major indirect impacts on our mobility needs. Technology development in the ITC sector is transforming our virtual lives and having profound impacts on our physical and mental mobility. In this section we discuss the interface between the wider mobility marketplace and our understanding of mobility mind-sets from the previous part of the report.

21.1 Mobility will be seamless for you

The objective to achieve complete seamless mobility between modes of transport for urban, regional or international travel is a primary objective of transport planners, whether they are urban planners, airport or port authorities, or the managers of rail interchanges: effectively taking the skills of logistics planning into the realm of human behaviour. In the description of the objectives for the air, rail and waterborne sectors in the EC Horizon 2020 Programme for research and innovation, it is stressed that, while there will be future generations of planes, vessels and trains, the primary problem will be the quality and management of the door to door journey – from the house to the
interchange, the rail hub, landside airport or port experience at origin and destination, and the journey to the destination. A majority of these mobility experiences involve journeys in and around major cities.

Seamless mobility is advancing at a pace, inspired by innovation in IT systems. Rather than the futile attempts in the past to benchmark seamless public transport against the private car in urban areas, new seamless mobility systems are now seen as involving all modes of mobility – public and private, formal and informal.

Part of the new seamless mobility is linked to two other mobility desires; the need for personalised and customised mobility. In the past, seamless mobility options were supplied and complex search engines provided advanced, real time multi-modal traveller information systems for people to use. In the smart phone age, seamless travel is being taken to a new level; particularly among the more digitally empowered generations. In the mind-set of these travellers the integration is achieved on their smart phone. This has an important psychological component as the locus of control and responsibility for the integration of the trip has switched from the mobility provider to the individual traveller. Individual preferences are programmed in so that the trips are within the person’s ‘comfort zone’.

21.2 Mobility will involve ‘Third places’

Transit zones – next to the home and factory/office – are the new fluid working areas. In a highly mobile and networked era, an individual’s home or workplace is just is just one node in this Small World Network. So living, working and socialising branches out to third places. These are public spaces between the home and traditional workplace – they could be railway stations, airports, shopping malls and cafes. Third places can enrich the way we live and can be important to the way society functions.

Decentralised spaces and services:

This is a throw-back to traditional forms of social organisation. Co-cooking space, co-working places or living rooms like clubs – specialised and active nodes made readily available in the neighbourhood. Time being the most valuable asset, outsourcing is seen as improving one’s quality of life. From laundry to grooming, people will turn to professionals while they work, relax or socialise. It is the 20 to 30 year olds that are the main consumers of these services.

Redefining urban space

With the increasing importance of third places and outsourcing, new urbanisation requirements emerge: Mobility hotspots – attractive spaces with readily available accommodation. Sleepbox, for example offers small boxes with beds, shower, TV and Wi-Fi on an area of 2.8 square metres. We can see the growth of smaller living units and small room apartments, reflecting our more decentralised way of living. In this context, mobility interchanges will need to offer multiple functions and services, ranging from work spaces to shopping malls. On transport vehicles, the traditional division into classes will become functional separation – silent spaces – work spaces – entertainment and even health spaces.

Flexible co-working spaces

The world of work will increase in its flexibility in the years to come. The buzzword is ‘mobile workers’. Our personal mobility increasingly determines whether we can obtain certain jobs, unite professional or private goals, reconcile demands and demands to improve our quality of life. Already today, professional jobs are not bound to specific locations. An increasing number of employees conduct work ‘on the move’. This location independence will only increase in the future. From 3rd wave coffee bars and bistro terraces to co-
working spaces and shared offices, these new job nomads want to be flexible and individually seek out and adapt their own mobile working worlds.

Sharing and collaboration is the mantra of the new generation. It finds a particular expression in trending co-working spaces: large office spaces in which different entrepreneurs pursue their respective activities alongside each other. Today more than 1,000 co-working spaces are distributed as international chains across the globe.

Entrepreneurial mobility

Co-working offices attract young, open-minded people who understand physical proximity results in positive synergies. They want to be successful entrepreneurs with their own business. At the same time they acknowledge that the future lies in project-oriented collaborations between the individual independently operating companies. Thus, co-working is not only spatial but also spiritual cooperation, enabling both concentrated work, as well as stimulating discussions and cross-pollination.

Young freelancers and start-ups

The typical co-worker is active in knowledge areas such as IT, marketing and communication, design or counselling. Co-workers tend to be in their mid-twenties to late thirties, with an average age of 34. Two-thirds are men, one third are women - the same ratio generally found in the wider entrepreneurial and small business statistics across Europe and the U.S.

Reducing the ecological footprint?

With co-working, people possibly still partake in fossil fuel driven traffic. However, it allows employees of companies based in mayor employment areas to work from decentralized co-working hubs nearer their homes, thus reducing traffic jams and CO₂ emissions.

A 2015 poll by MobileIron among 3,400 full- and part-time professionals across six countries, including France, Germany and the UK, discovered the rise of Generation M (for mobile Millennials), a growing demographic of hyper-connected professionals mixing work with pleasure. Members of Generation M conduct 26% of their work on mobile devices (compared to non-Generation M at 17%). 93% of Generation M plan to use ‘wearables’ for work tasks such as phone calls, emails and other activities

The communal work hotel

The Hotel Shani goes beyond bedrooms to meet with new nomadic lifestyles. According to the principle of the ‘sharing economy’, Viennese hotel ‘Shani’ provides different rooms and lounges for different uses, such as work, communications, recreation and dining, living the new lifestyle. Like the painters, Klimt and Schiele, or authors, Hugo von Hofmannsthal and Arthur Schnitzler, who would sit in a coffee house to exchange ideas and find inspiration in past times, both Viennese and guests can encounter each other at Hotel Schani. The special thing about Hotel Schani Wien is the opportunity for local and global cooperation. Thus, people, professional groups and friends from all around the world can communicate with each other and work together, in the spirit of the shared office principle.

When generations meet with Third places

Millennials are natural born supporters of (digitally enhanced) fluid working. Fixed working schemes and sites (offices or proper seats) kill their creativity and eagerness to create added value in their work. Millennials were raised in the Nineties and Zeros, when the rate of change started to accelerate exponentially and a wealth of new, interesting innovation and events were about to challenge their attention span. As a result, the concept of different working areas - including transit zones, third places - is very attractive to this change-oriented generation.
Prime Busters will also support Third places, since this time-starved (knowledge and service) generation is looking for time saving, and smart working space solutions. Like the millennials, this generation is attracted to collaborative and sharing space services. Having young children, flexible working at (or near to) home is an important plus.

Baby Bloomers will rather have mixed feelings. On the one hand, their Millennial-children are positive about using third (working) spaces and fifty-somethings are eager to express a younger lifestyle (disregarding their real age as a ‘survival strategy’). On the other hand, the ‘fluid’ working style (“wherever I lay my iPad, that’s my office”) may be natural and axiomatic for a digital led ‘tablet’ generation, but is likely to make Bloomers (and Masters) feel disabled or inhibited in their natural flow and working system.

Master Boomers will respond no rather than pro. More than Baby Bloomers, the Master boomers are accustomed to a fixed working space. Most of the Masters are retired, so there is no longer a need for a third ‘working’ space?

21.3 Future vending cultures and mobile lives

“*The growing need and desire for convenience reveals new (mechanized) vending modalities.*”

Foraging for commuters:

In a society promoting healthy lifestyles, vending machines were long frowned upon. Impersonal, often fed with junk food or designed to solve emergencies at most they seem relics of a bygone era. But in this new mobile service economy, the vending machine culture is experiencing a phenomenal comeback. Not only does it blend in perfectly with our 24/7 functioning society, its new offer also meet the increasing demands of mobile consumers.

Healthy lifestyles for people on the move

The new vending culture brings forth new concepts satisfying the need for convenience and freshness for the modern work nomad. As the need for quick solutions increases, vending machines will start offering healthier food options in addition to flexibility and mobility. Machines already supply fresh fruit, milk, or even organic, vegan or gluten-free foods. One machine even grows heads of lettuce using fluorescent light bulbs. But it needn’t stop there - vendors could promote healthier lifestyles: in the run-up to the Olympics of 2013, machines dispensed subway tokens in exchange for 30 squats in Moscow metro stations.

Infotainment machines

The new vending solutions are individual and tailored to specific locations or situations. They cater to our high standards of health, pleasure and time sovereignty: from personalized postcards or umbrellas in areas with high probability of rain to iPads in airports. Machines equipped with LCD screens could also function as bulletin boards, dispensers of (nutritional) information or as entertainment medium for the user waiting for his fresh meal to be prepared.

Food as a service

One of the hottest topics in the food business today is home food delivery.

Home grocery delivery is nothing new. Grocers began experimenting with that in the 19th century. More recently, Schwan’s has been successfully doing home delivery for 60-plus years.

Using the Internet to order and pay for groceries to be delivered to one’s door has been happening as well. Early efforts in this direction by the likes of Peapod, Webvan and HomeGrocer generated considerable enthusiasm, interest
and investor capital before falling victim to the dot-com collapse in the early 2000s. But there is now a sense that grocery home delivery may finally become a bigger business proposition, capable of generating the growth and returns many have long predicted.

What remains to be agreed upon, however, is how it will work. When people go to a shop, buy shopping and carry it home; this is now seen as a (rather inefficient) goods trip.

Whether simply browsing the Internet for meal and recipe ideas, or undertaking a major grocery shop, the fit between in-home, and now mobile, behaviours and the relatively complex task of in-store grocery shopping has developed positive synergies with today’s online grocery business models. One simple reason for this lies in the fact that shopping itself has progressively gone virtual, and while food (especially perishables) remains one of the last few remaining categories of consumer products to “go digital,” there is growing evidence that several aspects of grocery shopping are trending to online.

Food trucks

Food trucks sell prepared food in public settings from motorized vehicles, from which food is prepared and stored and customers purchase and eat. They operate as quasi-portable restaurants, serving customers on public streets, private property, and designated lots. The paper presents Los Angeles, California, USA as an example of how local governments address food and urban culture trends and how this regulation defines public space. Pro-regulation forces argue that food trucks unfairly compete with restaurants, congest sidewalks and streets, are unsanitary, and diminish urban quality of life. Anti-regulation forces argue that food trucks provide affordable and quality food, rejuvenate public space, fairly compete with size and open-air limitations, serve innovative and fusion cuisines, and represent Mexican, Mexican-American, Latino, foodie, and migrant culinary cultures. There are now over 100 food trucks, carts, and vendors permitted to sell healthy, interesting, convenient, culturally diverse, and delicious food on Vancouver streets. You can locate Vancouver’s food trucks and food carts by smartphone app.

Mobile food vendors have risen in popularity. New wave trucks sell fusion Mexican, Korean and Vietnamese items, barbeque, cupcakes, vegan, and other gourmet cuisine. Food and Wine magazine recently named Roy Choi of Kogi BBQ, a fusion Korean taco truck and emblematic of new trends, “best new chef.”

When generations meet with the New Vending Culture

- Since Millennials are very digitally enhanced, keen on convenience and favor a 24/7 orientation, they will probably be very receptive.
- As Prime Busters are a time starved, time saving cohort, smart vending solutions, close to work, home or daily routine will be very relevant, especially when they come together with working hubs or transit zones.
- Baby Bloomers will be rather pro than no. Like their Millennial-children, Bloomers are time starved and are looking for time saving, smart vending solutions. Vending machines, food trucks and similar smart vending services don’t require high tech skills; on the other hand, Bloomers (and Masters even more) are fans of a personal (human, not digital) vending service, but when time becomes precious, functional shopping wins.
- Master Boomers will react rather no than pro. Master Boomers - digital immigrants - are accustomed to a personal, non-digitized retail experience; most of the Masters are retired, so there is no longer a need for mechanized or ‘smart’ (digitized) vending services.
Future mobility for flexible living: digital neighbourhoods and yoghurt cities

21.4 Mobility and the future work-life balance

In the context of a 24/7 society and a dynamically changing working and living environment, finding a new, intelligent balance between work and private life will be one of the major challenges of the 21st century.

Operational work-life balance measures will be aimed to facilitate successful professional careers while honouring private, social, cultural and health needs. Integrated work-life balance concepts include specifically configured working time models, an adapted work organization, flexible places of work, management directives and other supportive health and preventive services for employees.

Smart work-life balance concepts should be understood as a critical issue, affecting our society and economy. A well thought-out balance between the private and professional life of active citizens is not only beneficial for the individual, but also for the companies employing them, and for society as a whole. As the members of communities move more and more to the rhythm of their very own agendas and work-life schedules, traditional family ties dissolve into a loosely patchworked togetherness. People no longer derive their happiness from the core family but from a broader social environment, and from the activities they perform with this community.

Just as the distinction between inner and outer social circles slowly fade, so do the borders between work and life gradually crumble and make way for a new perception of work/life and work/hobby. At its core is a multi-faceted lifestyle, which is fed by the many passions of an individual and his experiences and networks. Rather than climbing the corporate ladder in no time, people will focus on recognizing and exploiting one’s potential. A surgeon is no longer just a doctor, but a doctor/pianist. A unique, personality-forming lifestyle of the slash / slash generation is more important than a classical career.

Among the generations:

- For Digital Aboriginals these applications are not relevant, however they will easily consider them as usual and normal.
- Millennials will be rather no than respond pro. Although they love novelty and smart (digitized) services and products, Generation Y can handle their work/study-life-balance. Most of the Millennials have no children to raise. A substantial number of them are still living at their parents’ or - at least - make use of services (and finance), provided by their Bloomer parents.
- Prime Busters will definitely respond with enthusiasm. Primers are time starved (knowledge and service) and look for ways to control a time consuming (young) family life while working harder. Their agendas are often challenged by traffic congestion.
- Babybloomers are still time starved and are starting to put more focus on an optimal divide between controlling their career (entering the last stage before retirement), controlling their physical abilities and energy levels, and the upcoming drive to invest more time in personal relations and self-actualisation.
- Most of the Master Boomers on the other hand are retired, so the ‘survival need’ for a work-life balance has become redundant.
21.5 Flexible mobility futures

Depending on the degree to which a society is able to be flexible and mobile, it remains competitive in future

In the 21st century, labour markets are transforming drastically, adopting hyperflexible structures and concepts. The Fordism of the previous century is becoming more and more obsolete. This contract-based employment concept with fixed, 9-to-5 working hours, collectively agreed salaries, health insurance, allowances and dismissal protection is increasingly being replaced by a temporal and spatial flexibilisation of labour.

Temporary labour, freelancing, tele- or co-working – enhanced by an ever innovating technology, mobile working has become a matter of course – especially for managers. 73% of executives use a laptop and at least 45% own a smartphone, 49% work at least once a week away from the office or are on the road; 23% even two or three times or even more often. The non-managerial workforce has adapted to the new requirement of the labour market, bringing forth new and more erratic mobility patterns.

Families in motion

Also socially, the traffic of individuals no longer moves punctual and linearly – from work to home, from home to school or sports club. Families move in all directions at all times of the day. Mobility is a prerequisite for social participation, social progress, economic growth, self-realisation and individual success.

Meeting the need for flexible service

As people are perpetually on the move, businesses need to tailor their services to today’s demands of flexibility – even if this means involving people who are not on the company’s pay roll to do so. Tuning in on the sharing economy concept, Deutsche Post DHL managed to creatively meet his customer’s need for flexibility. With its MyWays-program in Stockholm, it offered customers the option for a hyper-flexible delivery when buying online. They simply had to specify the exact location and time they’d like the package to be delivered, along with a bid of how much they’re willing to pay. At the package arrival at a nearby DHL centre, MyWays-participants could retrieve the package, deliver it to its destination and pocket the fee of the customer.

Flexible future generations?

As the most connected and tech-savvy generation, Millennials not only expects technology to be used intuitively, but all facets of life have to be managed in an effortless, flexible way.

- Prime Busters will adopt this since this time starved (knowledge and service) generation is looking for ways to control a time consuming (young) family life while working harder (and their agendas being often challenged by traffic congestion); flexible mobility management is a (stress and time loss reducing) must.

- Babybloomers will be pro. Like the Busters, also coined Generation X, Bloomers are still time starved, longing for flexible mobility services.

- Master Boomers will be pro. Masters want to control (their) mental, social and physical life as long as possible, so they are asking for easy-to-understand, low threshold and flexible (technology and) mobility solutions.
• Masters have more (easily access to) financial resources to adopt e-mobility.

21.6 Future mobility and the new power of places

Show me how and where you live, and I show you who you are; said the German poet and philosopher Johann Gottfried von Herder. 200 years later, this adagio still rings true.

Section 7.3 in this report examined the changing nature of people’s perceptions of space and place; the link between man and the environment. That work not only stressed the multi-layered nature of space perception but also highlighted that, in the future, architects predict that the spaces between buildings (in the socially mobile environment) will be more important that the spaces within them.

Whether rented, owned or built homes and their interiors offer a deep insight into one’s personality. Conversely, studying socio-cultural changes and trends enables us to draw conclusions on how society will live tomorrow. Social megatrends such as individualization, mobility and health have a decisive influence on architecture and home design. But also economic crises, technological advances, collective needs and changing family structures influence the way we live.

Creative professionals, young and mobile, are conquering urban areas and driving new food and lifestyle concepts. More and more cities become sustainable places, where (environmentally friendly and noise avoiding) electric cars, connected vehicles, bike sharing (and fixing) stations, etc. are about to make the city behave more like a village. An interesting phenomenon are ‘Yoghurt cities’. Yoghurt cities, or neighbourhoods, are places (within cities) like yoghurt, with ‘active cultures’; vital museums, shopping, terraces, theatre, urban sportainment, tai chi-sessions in the park, downtown neighborhoods with throbbing street life, etc. Retiring Babyboomers are insisting on moving to (open, multi-generational) Yoghurt cities rather than (segregated) retirement communities.

When it comes to Digital Aboriginals, young urban children learn to re-connect with the (healthy, sustainable, safe, joyful, social and educational) outdoor. More and more cities are being re-conceived and redesigned as healthy, green and safe work-life-play zones (so-called ‘rurbanization’), where the prime digital generation can meet and understand real life.

Millennials are an outspoken high-tech-high-touch generation, happy to mix the magic efficiency (and efficient magic) of high tech with the beauty of yesteryear, ‘hipster’ design (high touch). They are the prime ‘collaborative’ generation, longing for co-creativity, not only by means of social media, but also by meeting up with peers in low tech co-creation caves (like coffee bars or co-working living rooms), where traditional craftsmanship and high tech tools go hand-in-hand.

Prime Busters look for a stimulating environment, where everything they need is - more and more - on hand (24/7 shopping, neighbourhood supermarkets, bike/car sharing ...).

Both Babyboomers and Master Boomers are rather pro. Like their Boomer counterparts (the Master Boomers), the Bloomers are attracted to the idea of a slow city, where slow and smart mobility has its place. Sharing vehicles though is a bridge too far for them as it is difficult to disconnect car usage from car ownership.
22. Mobility with a buzz

22.1 E-mobility

"Since in an urban habitat electric vehicles cannot be beaten in effectiveness, electro-mobility is driving the mobility concepts for the urbanized 21st century."

The development of e-mobility is primarily taking place in industrial and industrialising nations. In 2012, the USA owned 38% of the global electric car stock, Japan 24%, the EU 11% and China 6%. As prices for electric vehicle batteries drop, the overall purchase price for electric vehicles will decrease. Together with the rising fuel prices, improved battery ranges and growing charging infrastructure, electro-mobility will become more attractive. The number of electric cars is expected to grow from 20 to 30 million by 2030 to around 25 to 50 million vehicles by 2050 due to technological developments.

New business opportunities

Car manufacturers, railways, public transport, airlines and other suppliers of traditional mobility need to rethink their role and function within the mobility grid. In the slipstream of e-mobility, products and services will need to be created to support and enhance connected e-driving, not in the least creation and use of an intelligent charging infrastructure for electric vehicles and new billing models. New technologies stir up the market to create new opportunities and approaches for related industries. New players will emerge, establishing themselves in a cross-innovations market.
New e-lifestyles

With an electric vehicle, a quick stop at a service station is a thing of the past. Charging an e-driven motor happens while the vehicle is parked: overnight at home, or while the driver is working or enjoying leisure time. E-charging will drive the need for new ‘third places’-concepts: hotspots that combine living, working and relaxing spaces with docking stations for e-bikes and e-cars.

Everyone is an energy supplier

E-mobility will shift the energy provider landscape profoundly, decentralising it into a network of many small energy suppliers: homeowners with solar panels, farmers with a biogas plant or companies with small, private wind turbines. Current users will supply energy to a power grid that is increasingly intelligent, the so-called smart grid.

Smart grids and energy highways

In the future e-mobility could be completely self-sustaining: we could use roads as energy highways. E-vehicles charge the smart grid, with batteries serving as a buffer, and overcapacity from the smart grid is redirected into the car, charging the battery. Thus, electric cars trigger the birth of another logic concerning energy and mobility.

The missing mobility link

Especially the e-bike will change the way people address their daily individual transport. Electric bikes extend the urban biking radius and function as the preferred mobility mode - especially in regions with underdeveloped infrastructure. It allows overcoming long distances, regardless of a sparse infrastructure of public transport.

The generational response to E-mobility

- Millennials will respond with mixed feelings. They are natural born supporters of electronics and electric mobility is an attractive novel way of transportation, but the prices are too high (even for e-bikes).
- Prime Busters will be pro, but concerned about the (still) high prices of e-cars; regarding e-bikes, the interest grows for this time-starved and traffic-jam-bullied generation: e-bikes - often sponsored by their employer and the tax authorities - are speeding up the commuting (plus, there is less need for a shower at work, since electric biking doesn’t make you break a sweat).
- Babybloomers will be pro as well. Front-end Boomers are becoming aware of the need for "LOHAS" (a lifestyle of health (self) and sustainability (environment). E-mobility will provide a fair share in solving (urban and global) environmental and health problems.
- Master Boomers: pro - forced by their progressing age, Back-end Boomers are (even more) conscious of the need for “LOHAS” (lifestyles of health and sustainability). Master Boomers have the time to contemplate the consequences of their ‘fossil fuel lifestyle’ of the last decades. The declining physical condition and vitality of Master Boomers are making them adopt/buy e-bikes at a rapid rate. Bloomers and Masters have more (easily access to) financial resources to adopt e-mobility.
22.2 Future reflections on the self-driving car

“We will look at cars the way we look at horses today: very few people will own them. Experts will race them; we will watch them for entertainment.”

Glen Hiemstra, creator of futurist.com

“Both Google and Tesla predict that the 100% fully autonomous cars (where you could literally get in the car, go to sleep, and wake up at your destination) will be available to the public by 2020.

According to innovation and mobility experts we talked to, like Johan Peter Paludan (Copenhagen Institute for Future Studies) and Erik Van den Heuvel (Daimler Group), autonomous cars will be probably for sale in the year 2020 and will start to become commonplace by 2025 or 2030.

Automated cars could solve large portions of our environmental problems, prevent tens of thousands of deaths per year, save millions of hours with increased productivity, and create entire new industries that we cannot even imagine from our current vantage point.

The beginning is in fact already there. Tesla Motor’s declares that their 2020 models will be able to self-drive 90% of the time. From Morgan Stanley’s research we know that cars are driven just 4% of the year, which is an astonishing waste considering that the average cost of individual car ownership.

Maarten Kooiman, founder of car sharing scheme Tapazz argues that next to a house, an automobile is the second-most expensive asset that most people will ever buy — it is no surprise that ride sharing services like Uber and car sharing services like Zipcar, Car2go and Tapazz are quickly gaining popularity as an alternative to car ownership. But what is even more amazing is that the self-driving car will alter our attitudes and behaviours towards mobility in a never seen way:

Broad societal and environmental potential:

- Morgan Stanley estimates that a 90% reduction in crashes would save one million lives a year worldwide. Driverless cars do not need to park — vehicles cruising the street looking for parking spots account for an astounding 30% of city traffic, not to mention that eliminating curbside parking adds two extra lanes of capacity to many city streets.
- Traffic jams will become non-existent, saving the average commuter 38 hours every year—nearly a full work week.
- As parking lots and garages, car dealerships, and bus stations become obsolete, tens of millions of square feet of available prime real estate will spur explosive metropolitan development.
- The environmental impact of autonomous cars has the potential to reverse the trend of global warming and drastically reduce our dependence on fossil fuels. As most autonomous cars are likely to be electric, estimates are that 134 billion gallons of gasoline will be saved a year in the US alone.
22.3 Car sharing

The opportunity to enjoy a car without actually owning one is now a reality. As a result of growing eco-consciousness, resource shortages, skyrocketing gasoline prices, and parking scarcity in urban areas, the car is losing its importance as a status symbol. Car sharing offers an ideal mobility alternative. The promising development in the professional market has caused many providers of the car industry to market for potential part-time drivers. This will in the future lead to even better conditions in price and service.

The young and the carless

However fragmented the publicly available demographic data, car sharing users are predominantly well-educated, male young adults between ages 25 and 45. Living in urban areas, they are either single or childless couples, and tend to belong to middle and middle-upper income household. They do not own a car since, for these urban mobility users, there is no good reason for owning one: they tend to rely on non-car forms of urban transport – be it public transport, walking or cycling.

The structural downward trend in ‘auto-mobility’ amongst this demographic group can be explained by a new rational of everyday meaningfulness: this younger generation prefers using to owning. Another plausible interpretation is that the downward trending incomes for Millennials have constrained their use of private cars, while at the same time new technologies have made car sharing services more accessible and practical.

Corporate car sharing

The business world also greedily adopts new concepts to reduce or alternatively employ their car fleet. With the Alpha City car sharing program for companies, employees use fleet cars professionally, and – when needed - in their private time. In the latter case, the use is settled privately.

Car sharing as a pioneer of e-Mobility

Electric vehicles are increasingly used in corporate e-car sharing fleets. According to Frost & Sullivan, 20 % of car-sharing fleets will be battery-powered by 2016, which might drive corporate users to also consider an electric vehicle in their everyday life.

Car sharing in numbers

Car sharing schemes have been established in many cities (e.g. Car2go from Daimler, Drivenow! from BMW & Sixt) and are used by 2.5% of the urban population. While car sharing providers registered almost 50,000 drivers in 1997, the number jumped to around 500,000 in 2013. During this same time period, the car sharing car fleet grew from around 500 to just under 11,000 vehicles.
Future mobility: flexible, borrowed

22.4 Mixed mobility

Future intermodality – public transport and car sharing are becoming increasingly important. Intermodal mobility, which is switching (repeatedly) between modes of transport such as cars, public transport, cycling or going by foot, is clearly increasing. Cars in particular are experiencing a loss of importance compared to other modes of transport – they are increasingly seen less as a status symbol or expression of individual freedom but, rather, as a transport option among many and, therefore, are used more pragmatically. In this context, the desire for car ownership, particularly in cities and especially among young adults, is decreasing.

Car sharing concepts are becoming very popular. The number of car owners in the age group 18 to 24 decreased by 44% between 2000 and 2010. In the age group of 18 to 39, 36% more car sharing is attainable by 2020. At the same, existing public transport, cycling and footpath networks will be expanded and improved, so that inter- and multimodality will be possible and fostered. Public transport will be multi-modally anchored and converted to electro-mobility, in order to lessen the loss of importance compared to electric cars and to act as the backbone in intermodal transport.

Our 24/7 society today is characterized not only by a growing demand for mobility, but also by an increasing variety of mobility forms. Whether commuting to work, going to school, family or doctor visits, shopping and leisure activities, we are traveling to more places than ever before. More than ever, our lives are happening in between places.

The consumption of mobility as we have practiced it for decades is experiencing an historic turning point. We are entering a new commoditized and multi-mobile age. We are witnessing the beginning of the multi-mobile era.

Today we face challenges such as sustainability, new energy infrastructure and post-fossil mobility concepts. And there’s a need to find solutions for more efficiently networked cities, intelligent transport systems and services, and end-to-end solutions for personal transport.

Mixing and matching different means of transport will increase the security, speed and flexibility of road users. The future will see an increase of combined mobility, which today already exists in these forms:

- Park + Ride = car / motorcycle and bus or train
- Bike + Ride = bicycle and public transport
- Kiss + Ride = drop-off zones for passengers at public transport hubs
- Park + Pool = carpooling with start / end on a car park nearby the motorway
- Car-Sharing = organized community use of one or more cars

Whether combining motorized with public transport or a bicycle with a bus ride - a seamless transition between different means of transport is of vital importance in order for mixed mobility to become a success. To create functioning mobility chains and thus improve the framework conditions for combined mobility, all interested parties need to coordinate their traffic and spatial development.
“The future of urban public transport lies in mobility systems that will provide bicycles, cars and other mobility services on demand. Most mobility assets will be shared instead of owned by users. Convenient and reliable lifestyle services will be offered to connected citizens who will be able to easily access these combined mobility services via their smartphones.”

(Johan Peter Paludan. The Copenhagen Institute for Future Studies)

Combined mobility services are a smart alternative to car ownership in a rapidly urbanising world, as they are more tailored to customer needs and better suited to metropolitan environments. For those public transport operators who are able to innovate and turn public transport services into combined mobility services, these developments offer a real opportunity to deliver sustainable growth over the next decades.

The importance of infrastructure

Ageing urban infrastructure limits the adaptive capacity to the impact of mobility. The infrastructure in many cities in Germany (and worldwide) is out-dated due to insufficient investment funds. This restricts the capacity of cities to adequately adapt to the mobility needs in the field of multi-modal mobility concepts and electric mobility.

At the same time, the obligation to modernise infrastructure offers the chance to take new mobility requirements into account during construction. Today, competition for innovative and sustainable mobility concepts is on the rise, fuelled by European and national funding. The results, for example, have been the use of physical models for planning the flow of traffic in cities, which reduces congestion as well as fuel consumption.

Intermodal mobility, which is switching (repeatedly) between modes of transport such as cars, public transport, cycling or going by foot, is clearly increasing. Cars in particular are experiencing a loss of importance compared to other modes of transport – they are increasingly seen less as a status symbol or expression of individual freedom but, rather, as a transport option among many and, therefore, are used more pragmatically.

The end of boundless freedom

*Mobility expenses continue to rise, but the future is not necessarily faster. It is not the top speed that determines the mobile society of tomorrow, but the mode of transportation and how we actually arrive "best" at our destination.*
23. The ‘Arrival’ cities of the future

23.1. Arrival cities

The final great wave of urbanization will transform the human race into an urban species by the end of this century. It will also profoundly change family life, from large agrarian families to small urban ones, and will put an end to the continuous population growth.

From rural migration to social mobility

Today cities are home to more than half of humanity. By 2050 more than 70% of the global population will be living in urban environments. An unprecedented number of people will move from rural areas to the metropolis, creating new urban spaces in its core or outskirts. In these Arrival Cities, migrants struggle to integrate themselves socially and economically in order to establish a better future for their children.

Integrative mobility

The success or failure of Arrival Cities will have profound implications for local, national, and international economies. Cities where migrants are allowed to integrate in and contribute to urban society, create prosperous middle classes and thriving economies. Failed arrival cities create poverty and social problems with ensuing conflicts, revolutions and political crises. By providing citizenship, a chance to own property, good education, transport linking the arrival cities to the main city, and security, governments will successfully integrate their migrants.

Creativity and innovation

It is of critical importance to see and treat Arrival Cities as urban hotspots of social advancement, opportunity and innovation. Megacities need to tap into the impressive creativity that new city dwellers collectively and individually develop to get ahead in life - even under the most adverse circumstances.

Commuting between communities

Migration between rural and urban areas is not one linear migratory movement from the country to the city. It often performs a pendulum motion: Arrival City dwellers continue to maintain links with their rural networks, returning to get married and transferring money to relatives. Rural migrants of the first generation often vacillate between a rural and urban lifestyle all their lives, until the next generation really arrives in the city.
24. Slow food - Slow mobility

24.1. Slow mobility

Transport use will continue to significantly transform. People increasingly refrain from using or owning cars and engage in other forms of transport: combining modes of traffic, car sharing, public transport, and ... slow traffic. Slow or non-motorized traffic is mainly synonymous to cycling and walking. But also skating or moving with vehicle-like devices fall in this category.

The best way to arrive anywhere is slowly.

Globally, individual mobility is still very much determined by the use of cars with internal combustion engines. Motorised individual transport makes up nearly 50% of the global mobility market which - in terms of expenditures - amounts to EUR 6.4 trillion in 2010 or around 1,000 EUR per person.

Top efficiency

While mobility expenses continues to rise, the mobile society of tomorrow is not determined by top speed but by the mode of transportation that allows us to arrive best at our destination. Traffic tends to be so bad that at rush hour cars hardly move at all. Especially in (mega) cities and metropolitan areas like London or Berlin the average speed of auto-mobility tends to decrease.

To our good health

Slow traffic has a significant, still untapped potential to improve a city’s transport system, while at the same time protecting the environment, improving the air quality, reducing noise and CO₂ emission. In addition, it reinforces sustainable tourism, leading to savings in the public and private expenditure for mobility.

The bike rules

In a slow traffic culture, the bicycle gains importance to move across the city. Apart from being practical, innovations have made cycling more attractive and safer. Therefore, in coming years the market will experience a sustained boom. Today there are 70 million bikes in Germany alone, more than 4 million of them were sold here in 2011 - worth 2 billion Euros. 15% of all roads in Germany are already accessible to biking. In comparison, leading bicycle nations Denmark and the Netherlands can only boast a little over 18%.

Even more so than renting cars, renting a bicycle is far better than owning one. From free rental for short distances of up to half an hour to user-friendly registered use for people who need a bike for a longer period of time, the success of the municipal projects worldwide shows that innovative and flexible bicycle rental initiatives have yet to reach their full market potential. The boom of the bike in the public space will bring a diverse service and lifestyle culture with them. Urban planners must also react to the new cyclists, as well as the tourism industry, hospitality or leisure industry.
25. Mobility Mind-sets

When consulting research and experts, there is a broad consensus that the diversity of new mobility concepts that we face today (car sharing, ride sharing etc.) will lead to a landscape that is best described as ‘mobility as a service’. Vehicles – like aircraft, vessels, cars, bikes, trains - are not any longer at the heart of the mobility. Instead there is digital information based on ‘Big data’, that is accessible in real time.

“Digital information is the fuel of the future mobility. Some transport sociologists say that information about mobility is 50% of mobility. The car will become an accessory to the smartphone,” says Gilles Vesco.

Gilles Vesco calls it ‘The New Mobility’. It is a vision in which citizens are no longer dependent on their cars to get along – or worse – on public transport as we know it, but dependent on real-time data on their smartphones. Gilles Vesco argues that the real acceleration towards this new mobility behaviour will be brought by cities aiming to rebalance the public space and create a city reclaimed by people and is no longer occupied by cars.

Apart of Lyon, many other European cities lead the way forward in the same direction. Birmingham is now embarking on its own 20-year plan called ‘Birmingham Connected’, to reduce dependence on cars. For a city so associated in the public mind with car manufacturing, this is quite a step. The initiative is being driven by the veteran leader of Birmingham city council, Sir Albert Bore, who talks airily about imposing a three-dimensional transport plan on the two-dimensional geography of the city: “French and German cities all have an infrastructure which has a far better understanding of how you need to map the city with layers of travel.”

“Multi-modal” and “interconnectivity” are now the words on every urban planner’s lips. Also in Munich, bikes and more efficient public transport would be the norm; for occasional trips out of the city, citizens could hire a car or join a car club that facilitated inter-city travel. The statistic everyone trots out is that your car sits outside, idle and depreciating, for 96% of its life. There has to be a more efficient way to provide for the average of seven hours a week when you want it.

And when it comes to the user, professor emeritus Henk A. Beckers argues that it matches perfectly with the current rise of Generation Z. Z stands for Zero tolerance towards substandard strategies. This generation goes beyond age cohorts and corresponds maybe best with the Millennial mindset: wanting everything right here and now.

Babyboomers as the biggest active age group: We’re about to enter a people and purpose economy says Geertrui Jacobs, former researcher and strategist at Synnovate.

When it comes to mobility mind-sets, not all people have the same attitudes and motivations at every single moment. Depending on context, means, social status, psychological make-up, gender and age, their culture and geographical location, people may adopt different ‘mind-sets’ for navigating the world of (new) mobility. Above all, context defines mindset. Day-to-day commuting is a different context than having a trip during the weekend.

In the upcoming segmentation, we consider Mobility mind-sets as the different fundamental human drivers that define our behavior and determine our choices in how we use transportation.
26. Different mind-sets towards future mobility

SYNNOVATE’S MOTIVATIONAL SEGMENTATION GRID

26.1 The Motivational grid

The motivational grid builds on the work reported in earlier sections of this report. It may provide a useful way to visualize mind-sets for the forthcoming MIND-SETS approach (MIND-SETS 2015b). In this approach, mind-sets are mapped onto two uncorrelated axes.

The vertical axis defines the way in which mobility has gains for the individual: people have an emotional, open, accepting attitude to mobility and vehicles, versus people who take a more rational, controlling approach to mobility and who view it as a functional solution of getting from point A to point B.

• The horizontal axis denotes the way in which mobility gains social meaning – it is a social act, either you feel connected to the world around you (the US at the right), or you try to reinforce your ego (the ME on the left).

• When making a motivational segmentation in the spirit of Synovate, we define “the new Mobility” as a vision of regions, neighborhoods and cities in which residents no longer rely on their cars but on public transport, shared bikes, car clubs and - above all - on real-time data on their smartphones. The New Mobility will result in a new set of attitudes we can cluster and depict in a motivational segmentation.

Four kinds of mobility are defined:

• **New mobility is being free** (Enjoyment + Ego). In this group, New Mobility is a smart way to lead a more active, free and spontaneous life. The key drivers for this are: exploration, freedom, last-minute, flexibility, self-sufficient, multi-modal

• **New mobility is connectivity** (Enjoyment + Social). In this group, new Mobility as a more responsible, integrated way to participate in a community on the move. The key drivers: SHARING, community, local, social

• **New mobility is innovative** (Functional + Ego). Here we see new Mobility as an innovative way to be more in charge of your life, increasing efficiency and productivity. The key drivers: mastery, data, technology, innovation, disrupt the status-quo

• **New mobility is necessary** (Functional + Social). In this final group, new Mobility as a necessary way to protect the planet, and change the way we live in a society still dominated by car ownership. These key drivers: security/protection, responsibility, accountability, stewardship
When making a motivational segmentation in the spirit of Synovate, we define “the new Mobility” as a vision of regions, neighbourhoods and cities in which residents no longer rely on their cars but on public transport, shared bikes, car clubs and – above all – on real-time data on their smartphones. The New Mobility will result in a new set of attitudes we can cluster and depict in a motivational segmentation.
26.2 Emerging mind-sets

(i) From A TO B

The overall and default mindset of the New Mobility is about getting from point A to B in the most logical, no-nonsense, cost-effective way. Mobility has become a commodity. The A to B mindset has no emotional preference for car, train, bike, sharing programs etc... they just evaluate the pros and cons of the mode of transportation in a rational manner. They are willing to give up some personal freedom. People are supported by apps and big data to decide what journey to take. In this mind-set, mobility has become a commodity. In every country you see multi-modal applications coming up, allowing people to plan their route over the frontiers of vehicle types and suppliers of mobility. This mindset is about having basic control over travel time, connections, and price, preferably based on real time data.

(technologists often tend to see a solid communisation of mobility: Mobility as a service is like tap water. Emotional involvement is low. Today we see that even the first movers come with motivational strategic positions that recognize human beings as people driven by status, conviviality, fun, control, rest etc.

(ii) UBER everything

Uberization is not necessary Uber taking over all kind of mobility services. It means “digital platforms” enabling citizens find providers for analog services. With the mainstreaming of the on-demand economy and life in an always-on culture, consumers’ expectations for speed and ease are rising exponentially. They want more experiences and more information and they want it faster, easier, better, in small chunks, easier to digest, Bite Size. Today, there is an Uber for everything, and more are up to come. 9% of Millennials in the EU have already made use of Uber, as opposed of 2% of Babyboomers. There is an Uber for Asian food (Bento), for cheese and wine (Lasso) for marihuana (Meadow, Eaze, Canary,) Via Blade you can book a helicopter flight and via Blackjet, you can have an open seat in a private jet.

There is Uber for massages, tow trucks, cleaning, grocery, food delivery, computer repairs, laundry services, etc. There is even an Uber for Uber Services: a software platform for developers of Uber software: Mowares. Even for buying cars, there are Ubbers. Shift, Carvana, Carlypsso and Beepi lets you test drive any second hand car sold in San Franscisco in less than 45 minutes. Luxe is a service that links you up with someone to park your car, or provide other services - Instantly.

With the mainstreaming of the on-demand economy and life in an always-on culture, consumers’ expectations for speed and ease are rising exponentially. They want more experiences and more information and they want it easier, better, faster, instantly.
(iii) METOPIAN mobility

As more and more people have access to luxury products and brands, people are looking for different ways to stand out and get the applause. What makes me powerful and determines my status is the story I create and tell about the products, services and brands I select.

Mobility and social status are so intertwined that even when mobility gets commoditized, citizens (and companies) will cater people on their need to stand out.

Nowadays we see that Uber or Uber-like applications allow users to distinguish themselves with Luxury cars. Apart of UberPOP (the cheaper variant of Uber), there is UberBLACK and UberLUX. During the Cannes Lions Week 2015 (The World’s most prestigious Advertising Festival in Cannes), Uber hosted helicopter flights with Uber Chopper. Also in the context of Car Sharing schemes, we see how one distinguishes itself from the other. In Belgium e.g. there is a clear differentiation form Bolides (stylish, upmarket) versus Cambio (average).

(iv) Wetopian Mobility

Trust in big authorities is crumbling. Yet there is a belief in real people, a belief that together we can achieve more. A lot of people have taken advantage of crowdsourcing, start organizing local initiatives and support local products and P2P partnership. They are taking the economy back into their own hands. When it comes to mobility, citizens organize car clubs with their own cars, enabled by platforms like Tappaz. A typical and promising Wetopian solution is Blablacar, enabling intra-city mobility by ridesharing. Trust is key in this new economy. Peer reviews and rating are vital to make the market flourish where individuals offer and demand bikes, cars, rides, even motorcycles for rent. This market is not only driven by price, but also by conviviality and the pleasure of meeting new friends. Mobility enables social encounters, and this is nowadays enables by apps.

(v) Revitalising Mobility

We also call this ‘decompressive commuting’. Most people who commute everyday, are employed in the service or knowledge industry. This requires a lot of communication with different people, all day long. When coming home, the time pressure and intensive communication starts all over again. That’s way sometimes some people want to switch off, and miss out during commuting. They want to refresh their minds, and consider their journeys as moments of meditation, tension release or just enjoy me-time in a car as media rich environment or even a high tech cinema capsule. They furnish their car with their favorite CD’s, make phone calls with loved ones, or sing along with their favorite songs.

When the truly fully self-driving car hits the mainstream, cars will make the switch to enable moments of distress for 100% not requiring you to hold the steering wheel.

(vi) Vehicle petting

Today 18% of families in the UK give their car a nickname. On top of that, is seems that cars with a nick name are better taken care of than others. With the always faster evolution of robotization and integration of intuitive technology in cars, a group of car ‘fanboys’ will rise. Big box movies like Real Steal and Ex Machina explore this relation between artificial intelligence, robots and
humans and explore how deep humans can establish emotional relationships with machines.

They will see the world of mobility as a world full of opportunities and crave the new as it represents advancement, excitement and experiences. As much as possible, car fanboys will enhance their seamless interaction with cars and will always keep trying out different modes of transport. Relations with vehicles are great expressions of keeping re-inventing the self.

(vii) Integrated living

As people live in smaller places, and are constantly on the move, they want full access to everything in the neighborhood they live in. They make use of Third places to meet, and cater all of their needs.

Neighborhoods become more pleasant to live in and density with services is increasing. Many services are dedicated to avoid mobility and wasting time. “Lifehacks” are the new business icons: solutions that are easily accessible, intuitive and full integrated with each other so they can ease life and achieve balance: Everything available at the push of a button. When it comes to mobility, this mobility mindset is rather about avoidance of mobility, or creating certainty that life, work and play goes on.

(viii) On top of the flow

New technologies mean that people can now gain insights into their own behavior, allowing them to better manage, monitor, control & adapt their daily lives and activities. Control over drive time, cost and comfort is key. These intelligent apps prove that there is no longer an excuse not to reclaim one’s own responsibility for what happens in life.

We will see the rise of a new breed of intelligent apps that prove that there is no longer an excuse not to reclaim one’s own responsibility for what happens in life. Not less in the field of mobility. Years ago Toyota came up with the ‘Glass of water’ application. This iPhone app allowed drivers to monitor their driving behavior. A virtual glass of water was simulated standing on the dashboards. Drivers were challenged not to spill a drop while driving, and driver performance could be compared with other drivers in the network. Other applications will help people control their blood alcohol concentration (or that of others), their concentration capacity, road congestion, etc...

(ix) Up-smart Mobility

Important aspects of life that seem separated like mobility, commuting, groceries, dating, exercise, work etc... will find seamless connections in order to get in tune with people’s attempt to manage their time in effective ways. Apart of Amazon’s Prime Air (a futuristic delivery system with multi-rotor Miniature Unmanned Air Vehicles technology intended to utilize GPS to autonomously fly individual packages to customers’ doorsteps within 30 minutes of ordering) there are many other smart tech solutions on the go. The internet-of-things makes it possible that different services talk with each-other. Bringme is a Belgian start-up providing intelligent boxes connected to the smartphone for home delivery.

Some people are consciously looking to manage their lives much better in order to rise above the mass and stay ahead. Smart sensor-connected devices help you to continuously improve your quality of life, even on the go: Smarter, better, leaner, meaner, more efficient - more up-smart.
27. The road goes on and on...

Endnote

This report has travelled a long road, absorbing intelligence, coordinating it, generating new ideas and innovation on how we should view mobility in the modern and future world. For example, we can see that mobility is itself moving – it is more and more migrating to a ‘service centred’ concept, rather than a ‘product centred’ concept.

Our journey has taken us through many disciplines and modes of thought; each with its own language. The list is long: anthropology, architecture, economics, geography, Newtonian physics, philosophy and psychology and sociology. What we have discovered along the way is that the disciplines share some common ground on how to view mobility and at the same time, bring fresh insights and innovation.

We started this work at the baseline of current transport planning – individual trip decisions, only focusing on trips made – on getting from A to B. As we stated at the beginning, the work has taken us on a journey to discover the complexity and depth of mobility, and its profound impacts on personality, identity, image and (importantly) mental and social well being. Only by this full understanding of mobility can we provide accurate advice to policy makers and to all those innovating products and services in the mobility marketplace.

We are confident that the reader of this report will come to this point, looking at mobility with a clearer, wider vision – and maybe some self reflection and reflection on others.

The challenge now is to process the intelligence in this report into the MIND-SETS approach; and then to provide guidelines to our target groups to provide concrete advice to European policy makers and those in the wider mobility economy.
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References contributing to this report


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