Sustainable Mobility Guide for Municipal Leaders

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Sustainable Mobility Guide for Municipalities

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Preface

This small book presents an overview of all the major themes that are involved for towns and cities to become more sustainable and more enjoyable places to live in. An attempt has been made to cover all the main topics, from transport issues to city planning and infrastructure, to pace of life and economic vibrancy. We offer a look at many positive examples of sustainability and we present you with real examples of cities and trends all around the world that have done or are doing marvelous things. Specific recommendations and practical ideas are presented as well, to aid the work of policy makers and urban planning authorities. A very useful part of this publication is the resource guide in the appendix, which offers information and addresses for further exploration. Many of the organizations and movements listed can be consulted with for further information and advice in matters related to their respective fields.

We have created this with the best hopes that this can be a useful tool for you in your area and in your work, and we will be happy to receive your feedback.

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Introduction

“The voyage of discovery is not in seeking new landscapes but in having new eyes.”
- Marcel Proust

A vision unfolds

Some of the most enjoyable places to be, containing content and happy communities are not mainly a product of sudden economic growth or because the local government hit a jackpot full of gold. The real reason is rather that one or several of the leaders or community members made a conscientious choice to move the town in a sustainable and positive direction – and this will power and foresightedness has made all the difference in the community.

The place where it started, the impetus for moving a community in a positive direction, can be found in a vision: The vision of a sustainable community, a place containing beauty and where citizens live in a healthy and peaceful environment, where their children have places to play, and where it is fun and easy to get around. This guide intends to help inspire the formation of such a vision. It also provides insight into the various components that can help make such a vision work.
There are many ways that a community, its citizens and leaders can choose to become more sustainable and provide a more livable place for its inhabitants. Many of them are listed here to aid in the guidance for city leaders and urban specialists with ways to make real and positive differences in their community. Furthermore, these are realistic devices, whose implementation are first of all a matter of choosing the right path for the community, second only an issue of financial costs. If a community deliberately chooses to pursue a policy of making their city or town a “pleasanter, calmer, more easily navigable and fun place to live”, then ultimately all of the suggestions will pay themselves off and be more rewarding in the long run. The key and the matter of fundamental importance is simply the decision in the first place to take charge of a long term policy of creating a healthier and more sustainable community – together with the right tools.

Many communities have had turning points and important dates in their history, some of which you can read about in these pages. Maybe your community will also experience a meaningful shift in outlook about how to approach and plan for a more human friendly environment in which to live?

Coming to terms with the need for change

While this guide takes every effort to paint a positive picture of what a sustainable community can look like, and the hope is inherent that imagining this picture and catching such a vision can naturally take place, it is also the case that we must first highlight some of the negative trends of the increasing motorization of cities. We hope that common sense will win out, once all of the ramifications of car-centric societies are laid bare: from the grave environmental and health concerns, to the need for guaranteeing a positive habitat for children, to restoring peace and calmness to currently noisy and traffic-clogged communities, to multiplying usable space and offering an easier and more enjoyable lifestyle for city residents. Given such a strong case for action on creating more livable communi-

ties, any well-intending mayor or municipal leader will almost certainly choose the course of a more sustainable future and higher standard of living for its citizens. Be it a new vision, a change in course of policy, or the discovery of instruments and developments happening all over the world, that will lead to such changes, such a path will be needed if we want to be honest with our citizens and give them the best chances for a happy, safe, and healthy future. It is unlikely that a full program for improving the quality of life of a city can take place without at least some limitations imposed on the use of the motorcar, however we would like to present the case that the end effect of such a program will certainly produce positive results for all to enjoy.

The content of this guide

In the first section we can read about the impact that the current increase in traffic is having in towns, breaking down the impact and effects of a heavy reliance on the motorcar for transportation along environmental, social and economic lines. It should be noted that while the overall tone of this book is a positive one, with encouragement and hope presented for a nicer environment to live in, this first section will necessarily have to deal with some of the less pleasant aspects of modern life. Hopefully, the reader will not become too depressed with the current situation, but rather inspired to work for ways to improve things, and read on!

In section two we analyze the maxim “what you build, they will use”. Examples are given to support the notion that infrastructure built often brings the demand to follow it, and that wise choices made by policy makers can result in the highest levels of user-end satisfaction. The key is to think long and hard about both current or future policy as well as major projects to be considered for implementation, as these will have lasting consequences.

Section three presents the results of a closely studied phenomenon called traffic evaporation. Major European Union research indicates that contrary
to what might be expected, closing off parts of a city center to traffic will produce an overall lesser amount of trips made, thus increasing the levels of peace and quiet for the local residents and making the city center more attractive for visitors.

Section four revolves around city spaces and the possibilities for improving the city in many different ways, making it easier to get around and more stress-free. Many techniques and examples are provided on how to make cities more attractive, more safe, less noisy and more fun.

In section five, sustainable modes of transport are looked at more carefully. There are many ways of increasing the overall efficiency of public transportation networks, many of them at only a small cost. When the overall transport picture is looked at, including situations involving public transport, biking and walking, then the picture of a city is created where people will naturally choose such types of transport, due to their attractiveness, efficiency and ease.

Section six discusses sustainable mobility and the pace of life. While the former discusses the need for a comprehensive strategy on dealing with traffic and mobility questions, the latter looks at the related issue of speed and the pace of life. This section also touches on urban arrangements and their relationship to mobility.

Finally, section seven wraps it all up, by putting the different parts together that are needed to achieve a sustainable city. Here the need for a strong local economy is an added dimension. Briefly touched upon are other issues that complement sustainable mobility issues, but lie mostly out of the scope of this guide.

There are three appendices to this guide. The first one lists many of the practical suggestions that have appeared in the guide as a handy reference. The second one showcases many of the best practices in both the transport sector and urban issues, happening around the world today. The third lists various organizations, current projects as well as suggested readings in this area.

Certain terms are marked as special vocabulary with an asterisk (*), which means that an entry is provided in the glossary.

“One of the greatest ironies of the Twentieth Century is that around the globe, vast amounts of such priceless things as land, petroleum, and clean air have been relinquished for motorization – and yet most people in the world will never own an automobile.”

-Marcia D. Lowe

The industrial period has brought about mass-production, mass-distribution and total integration of the personal car into our everyday lives. Car ownership, driving and personal transport offer many opportunities and obvious benefits for the user. These joys and benefits are however soon counter-balanced by disadvantages, with harms and losses affecting all, not sparing the owner and user of the car.
There is an inevitable inverse relationship of the benefits compared with the harms when taking into consideration an increasing frequency of personal motorized transport*: the negative impacts increase as the positive ones fade away. Urban development must adopt one of two approaches. Cities will have to choose which direction to go, as a full, unmitigated level of support of all transport modes and infrastructure will soon become impossible.

Simplified to provide clarity, the two choices of a city are:
1) Develop, invest and build more in an attempt to meet the demands of a rapidly growing personal motorized transport.
2) Reorganize, redesign and plan for measures to alter the trend of an ever-faster growth of automobile use and other personal motorized vehicular traffic.

If we could imagine for a minute the separation of a city into car-accessible and a car-free sections, where an individual choice could be made between living and working in a car-oriented or in a car-free district, car ownership and use would thus become a near private affair, as life-styles (with all of its conditions and effects) could be chosen freely by individuals. Car ownership – a person’s free choice – is usually thought of as a completely private affair, as if we actually did live in cities segregated according to use or non-use of the car. The truth, however, is that car use and car-based infrastructure have wide-reaching effects on all of us, whether we own a car or not. It is thus imperative that take a closer look at the impacts of widespread car usage, in order to make a more informed and wise decision about our attitudes and the direction in which we wish to take our communities.

The wise leader and the concerned decision-makers, who really care about the health and well-being of their communities must take an honest look at the current trends of the auto-centric society and all of the effects that have been ushered in during the car age. Only when the exact nature of the problems affecting a given society are fully understood, can solutions be found that are guided by the real desire of improving the life of all of the citizens. Decision makers should come to realize that both decisions made about the future of a city as well as indecision in acting on issues have real effects on their community.

### A quick drive through Carville

Before we consider the various impacts that cars have on our health, our societies and the environment, let us take a quick look at the reasons we do have for driving, considering also the backdrop of an auto-centric society.

**Speed and Freedom**

Arguably, the two leading reasons for owning a car are its inherent speed and the opportunity to go when and where the driver wishes. The latter, given the name “freedom” has often been touted as the American dream, and has given rise to stereotypes of rugged individualism and an independent lifestyle. While there is an obvious appeal to this romanticized ideal – given that it is being tried out all over the world – the truth is usually more mundane: the daily drive to work, running errands and picking up the kids from school.

**The loss of speed in relation to time**

Regarding particularly the speed that cars possess, while by itself it seems to provide the car with a huge advantage to every other form of transport, once the factor of time is included in the equation, a general fact about the automobile and travel with it that we can consider is the amount of time spent dedicated to it. The philosopher and social critic Ivan Illich has made a calculation of the time put into the different components that relate to driving and that require time investments:

The typical American male devotes more than 1,600 hours a
year to his car. He sits in it while it goes and while it stands idling. He parks it and searches for it. He earns the money to put down on it and to meet the monthly installments. He works to pay for petrol, tolls, insurance, taxes and traffic tickets. He spends four of his sixteen waking hours on the road or gathering resources for it. And this figure does not take account of the time consumed by other activities dictated by transport: time spent in hospitals, traffic courts and garages; time spent watching automobile commercials or attending consumer education meetings to improve the quality of the next buy. The model American puts in 1,600 hours to get 7,500 miles: less than five miles an hour. (that equals 12,000 kilometers and 8 km per hour)

It has been noted elsewhere that this does not include the ever greater amounts of time spent in traffic jams. Sitting in traffic jams has both a time value and money value associated with it. In fact, it has been estimated that time lost in gridlock can cost European nations billions of Euros.

Paying a large bill

Considering the up-front cost of driving, it can many times appear to be a cheaper alternative to other modes of transport, when only the fuel is compared to the cost of a bus ticket. This comparison is often made, resulting in the fact that many people choose the car over a sometimes expensive bus or train ride. However, just like there are many hidden aspects of time spent in car-related activities, so are there also many hidden costs to driving. It should first of all be realized that the automobile industry, including the creation of highways, are usually greatly subsidized by government, many times along with an inadequate level of funding for public transportation. However, just concentrating on the costs handed down to the end-user, there are still many extra monetary costs, that go beyond the fuel costs: Purchase of vehicle, maintenance of vehicle, payment of fees, such as insurance, driver’s license, car registration. Add to that all of the small costs like oil-change, green card, toll roads, parking. Then there might be large costs, such as hospital or doctor’s fees. While the figure is already a lot higher, it still comes short of the total cost of driving, which can be added up by considering the large subsidies of many governments in building expensive roads and car parks and in generally supporting the automobile industry.

A car for short trips

It should also be noted about the car, that the average distance a car makes daily is below 20 km and one third of the trips that a car makes is less than 3 km. In traffic less than 2 hours a day, cars still have to be accommodated, which involves either a real designated parking space or other space taken away from sidewalks, for example.

The Environmental, social and health-related impacts of cars

Fossil fuel emissions

Probably the most widely understood adverse effect of the automobile age is that of the car’s fossil fuel emissions. Global warming, which has now rightfully become a buzzword, is caused by the greenhouse effect*. In all, transport is estimated to account for 20-25% of all greenhouse gas emissions. Motor vehicles are the single biggest source of atmospheric pollution, contributing an estimated 14% of the world’s carbon dioxide emissions from fossil fuel burning, a proportion that is steadily rising. Add the emissions from exploration, transportation, refining and distribution of fuel, and this figure is 15 to 20 percent of world emissions. The average European car produces over 4 tons of carbon dioxide every year.

While a thorough discussion of global warming goes beyond the scope of this book, it should nevertheless be appreciated that scientists are becoming more and more certain of the great dangers of global warming. Serious and respected scientists are claiming that a reduction of greenhouse gases is needed closer to 60%-80% rather than the 5.2% cut dictated
by the Kyoto protocol. The effects of global warming can lead to an environmental catastrophe even in our own lifetimes: Weather will become more and more unpredictable, with some areas of the globe experiencing flooding and very cold weather while other places will become extremely hot and dry. A great displacement of people in search of livable climates will then follow. It should be noted, that since the deep waters of the planet take such a long time to heat up, we are currently experiencing the main effects of CO₂ emissions from 40 years ago. As every community in the world plays a role in this, it is indeed a global problem that needs to be addressed also at the local level.

Motor vehicles generate more air pollution than any other single human activity. While global warming can potentially lead us to an environmental catastrophe, the pollution caused by burning fossil fuels has already been having an effect on human health for a long while. Cancer and asthma are both diseases that find a direct link in pollution. While the negative effects of carbon dioxide and carbon monoxide have been fairly well known for a while, the negative effects of microparticles, found especially in diesel emissions, are gradually becoming known, and are shown to have devastating consequences for human health. Add to this dioxin, which is a by-product of pollution, yet according to some, is thought to be the number one cancer-causing force in the world. Dioxin, through pollution, finds its way into the food that we eat, hitting meat and dairy products especially hard. New findings also suggest that the nutritional components of many food products are being compromised, thus creating a greater need for nutritional supplements.

In the U.S., the American Lung Association estimate that between 10,000 and 24,000 people die each year as a result of traffic related air pollution. Epidemiologists and public health specialists in the U.S. and U.K. indicate that up to 60,000 Americans and 10,000 British are killed each year as a result of particulate pollution. In Hungary, a recent finding has come out, claiming that the pollution emissions in the city of Budapest, caused foremost by the traffic situation, will account for a reduction in the average life expectancy by three years.

**Accidents**

Apart from pollution, road accidents account for the other major health impact of travelling by car. Over 40,000 deaths occur on the roads of Europe every year. Four out of five fatalities occur in urban areas. A million people die on the roads every year – 10 million are estimated to be injured. At a daily rate, the figures have been thus calculated: 3,000 people die every day, around the world, in traffic. On top of that, 30,000 people are injured every day.

**Environmental destruction**

Not just human health is at peril due to pollution, but the natural and animal world is as well. On the one hand, the pollution itself or the accompanying changes brought on the climate are devastating enough to natural habitats, but when we add to this the fact that more and more roads are being built through natural areas, which brings with it many other developments and further sources of human engineered pollution. An indirect yet very potent impact of the automobile is its spread of human activity into many reaches of the natural world, producing not just pollution, also a large amount of waste, a loss in space and natural habitat, and much more.

Furthermore, the great amount of materials needed just to manufacture a car are so high, that according to some estimates, a car produces more pollution in its period of manufacture than in its entire lifetime of driving. This includes raw materials such as steel, iron, rubber, plastics and aluminum as well as large amounts of substances that deplete the ozone layer as well as huge quantities of energy.

In considering the „strictly” environmental effects of pollution, it should not be forgotten that human
health and well-being is very closely tied to both the plant and animal world. In fact, we could not live without plants and animals. Thus, considering an environmental perspective involves a consideration of humans just as much as it does of plants and animals.

**The waning of the oil age**

Most cars run on gasoline or diesel. These are derived from petroleum, commonly referred to as oil. Globally, motor vehicles use one third of the world’s oil resources. The extraction of oil involves habitat loss, oil spills, air and water pollution, large emissions of carbon dioxide, regular humanitarian abuses and international conflicts. The living conditions in many areas where oil is extracted is harsh. We can consider here the poor living in the environmental wastelands of Nigeria’s oil producing areas or the effects of oil extraction in Azerbaijan. The strong protest against drilling for oil in Alaska has made it clear that there are very serious societal and environmental effects attached with oil extraction.

However, when considering oil, we must also keep in mind that it is a non-renewable resource and that the dictates of peak oil* are that we are now nearing a period of decline in availability. The most optimistic studies estimate that oil reserves will be sufficient for 30 years, while skeptical estimates allow for only 10 years of further extraction without a new explosion of oil prices. One thing is for sure: The record high prices of today, even if they do level out or occasionally slightly drop, will only continue in the direction of price increases. The age of cheap oil is over, which is already having a strong effect on North America, as it is there that the greatest governmental subsidies for oil exist.

**The effect on communities**

Neighborhood streets and the traffic they bear do have an impact on the social fabric of that neighborhood. For instance, the average number of friends a person has within his or her neighborhood corresponds to the speed and volume of street traffic. Sociologist Donald Appleyard discovered that on a street with light traffic — 2,000 vehicles a day — residents had about 10 friends and acquaintances in the neighborhood, as compared to a street with heavy traffic — 16,000 vehicles a day — where residents had only four acquaintances, including on average 0.9 friends.

Severance* is the term given to the effect that a busy road can have by cutting a line straight through a community or an Eco-habitat. In the case of communities, it can imply that a person might have to travel a long distance or encounter many difficulties to reach a location that is not necessarily that far away, as the bird flies. For ecosystems, it means that species have a limited habitat to live in, and that when some animals do try to cross over a busy highway, they often do so at their own peril.

Community is very important to the health and wellbeing of both a society seen as a whole as well as for each and every individual. Another loss for the community, when cars become the dominant mode of transport, is the loss of human interaction. In communities that involve lots of walking, communal transport and public space, the amount of interaction, especially chance meetings, mark an overall vibrancy of a community that can never be achieved by a society where the automobile is the chief form of transport, as here there are very few chance encounters, planned meetings are the order of the day.

**The loss of Space**

If on the one hand, cars create pollution, environmental and health problems, then on the other hand they are great consumers of space. It is an undisputed fact that cars require a great amount of space. This is because they are the largest things on the road. In fact, as they become more popular they need more and more road space and more and more roads. When they are not in use they need to
be parked somewhere. Altogether, an auto-centric city takes away a large proportion of space from pedestrians, when compared with the times before the auto age or with cities that have a relatively small proportion of car use. In some cities, travelers by foot are daily faced with cars parked on their sidewalk. In Berlin, for example, even with a high standard of public transportation as well as bike infrastructure, and an unusually high amount of green space, 40% of available land is still taken by the automobile. In other cities, the percentage is much higher. This results in a loss of places to go, and street life, which leads to vibrant communities and economies, loses out. It is no wonder that many cities are choosing carfree zones for their centers, where the most interesting and stimulating elements of society, culture and commerce take place.

Not exercising

The health benefits of choosing active methods for getting around, such as cycling and walking, have become obvious. Research has shown that sedentary lifestyles will necessarily bring many health complications, while cycling on a regular basis, for instance, can bring a 40% reduction of disease risk compared to sedentary lifestyles. In general, all things point to the fact that the more types of active travel are enjoyed and promoted, the healthier citizens will be.

Noise and Visual pollution

Anybody who has lived in a large city is familiar with the noise that comes with being in a large city. Whether it is of traffic rushing by, the screeching sound of brakes or car alarms going off at night, this has all become quite normal to the city dweller. Non-city dwellers have been observed to need some adjustment time to the noise of cities once they arrive. And visually, rows of parked cars as well as large parking areas often provide a less pleasant view than a city park or a pedestrianized cobblestone square.

“If you build it, they will come” -ancient proverb

Infrastructure that becomes developed largely influences patterns of use and can often be seen to create demand. While transport related policy and planning measures are often treated as a response to the particular demands and traffic patterns of a region, the fact should not be overlooked that existing and newly developed infrastructure will themselves greatly affect travel behavior and influence the modal split*.

This section looks at what happens when different types of infrastructure (together with a different set of encouragements or endorsements from the side of the authorities) has been offered to the residents of diverse cities. While urban planning issues are considered in section four and specific transportation scenarios are covered in section five, this section wishes to illustrate how policy decisions have shaped towns and cities in very tangible ways: provided here are real examples from around the world.
Los Angeles and Venice: covering the whole spectrum

Los Angeles, USA, is often considered the most auto-centric city on the planet, whereas Venice, Italy is the foremost carfree city. These two cities therefore function as the two ends to a kind of spectrum, that cover many cities in between, and that offer us a clue as to what results when cities and infrastructure are built up in certain ways.

Greater Los Angeles is the home to 17 million people and nearly as many cars. This city has in many ways been developed with the automobile in mind. The city is criss-crossed by multi-lane highways and multi-layered exchanges, on-ramps, off-ramps and every possibly road-based infrastructure you can imagine. Much of the city is on the grid system, with wide, heavily traffic roads to be found every few kilometers. Modal share* of public transport is extremely low, however recently, some improvements have been made to the public transport service. Shopping has been designed almost exclusively for the driver. In relatively dense neighborhoods, shops that are close to the street lack an entrance from the street, one can only enter through the parking lot in the rear. In lesser dense neighborhoods, a large parking lot separates the street from the store entrance. In both cases, the pedestrian shopper is at a distinct disadvantage. Being a pedestrian, in fact, can come close to being considered a suspicious species: Police have been known to pull up to pedestrians and question them, simply for walking instead of driving on the side of a busy road.

Venice, on the other hand, has been favored by history with the ideal conditions for being a compact, beautiful carfree city. Due to the system of waterways and the medieval nature of the buildings in the city, it was never practical to give it over to automobile transport, and so it was able to remain a splendid city, that today attracts large numbers of tourists. Being a fairly small city and owning a unique set of characteristics and history, the Venice model has not been replicated on such a scale elsewhere, although the appeal of a carfree historic city setting can be witnessed in many great cities which have chosen to limit or banish car travel from their historic centers.

While these two cities can not be treated exclusively in a black and white manner, as Los Angeles does obviously have some positive characteristics and Venice some negative ones (and they are also situated in otherwise very different settings) it does nevertheless illustrate a very important principle: What gets built usually gets used. If you build highway after highway, you are inviting a high level of highway users. If instead, you develop quality cycling infrastructure, you make it easy for people to ride their bicycles, and they will do it. It then follows logically, that an appropriate policy must precede the adoption of development plans, as these will necessarily have far-reaching effects.

In between Los Angeles and Venice there is a whole host of other cities that can provide both good and bad examples of how infrastructure and policy have helped to shape the way that cities are. Thus, a number of different cities are visited in this section, as we take a look at how infrastructure and policy decisions have shaped their paths.

Bogotá, Columbia

Bogotá, the capitol of Columbia, is a city with around 8 million inhabitants. Historically, it is a poor city which has seen a lot of crime as well as transportation chaos. From the middle of the 1990s, two mayors began to implement programs of change. The first one was Antanas Mockus, who governed between 1995 and 1997, and set the tone for what would eventually happen, under the lead of Enrique Peñalosa, the transformation of a city by ushering in sweeping urban infrastructure and transport reforms, and become a global success story, without parallel anywhere for the kind of changes seen in a large city in such a short time.
A few of the results from this period:
• daily time lost to congestion was cut by a full hour
• transport speed increased by 43%
• air pollution lowered by 16%
• fuel consumption lowered by 10%
• modal share of bike use jumped from 0.3 to 5%
• car use in peak times lowered by 40%
• deadly traffic accidents down by 13%
• homicide rate down by 12%

Since Colombian laws bar an incumbent mayor from being reelected, in 2001 Antanas Mockus was elected for another term, to continue the same programs. Peñalosa, who had by now acquired a name for himself internationally, was invited around the world to give lectures and presentations on the “Bogotá miracle”.

Bogotá has not allowed itself to rest on its accomplishments. The plans exist to continue the trends for many more years. On one Thursday, in February of 2000, the entire city was run without cars used anywhere. This happened in a city about four times the size of Budapešť, Hungary! This was then established to become a yearly practice, after approved in a referendum. Future plans are to ban cars altogether from the streets every weekday between 6 AM and 9 AM as well as between 4:30 PM and 7:30 PM, on weekdays, from 2015 onwards. At this point, it is expected that the TransMilenio BRT system will move more than 80% of the city’s population, and that the bicycle network will also be further expanded.

Everyone now acknowledges that the quality of life in Bogotá has drastically approved. It used to be a city where its citizens were unhappy in, but now, Bogotá citizens are proud of their city and looking towards the future with optimism.

**Induced travel**

Traffic induction is a phenomenon that is observable in those places where roads are widened to accommodate more traffic flow. What happens is that in the short term that this new road space itself actually generates more vehicle traffic, and in the long run it also implies higher car ownership and lower
density settlements. The effects of this can be seen on a very advanced level in many cities throughout the USA, where cities sprawl in all directions, with primarily low density settlements, too low to sustain an adequate public transport system, yet high enough to generate lots of vehicular traffic. The opposite of traffic induction is traffic evaporation*, which is what happens as you narrow roads or remove large amounts of traffic, and it results in less overall traffic. This is looked more thoroughly in the next section, along with examples.

It appears that many cities in the USA have in fact reached a point where they are beginning to turn away from such car-oriented developments as have dominated most of the twentieth Century, and attempt to even reverse many of the trends. Some cities, like Fresno, California, have recently installed anti-sprawl new housing legislation, while Tucson, Arizona has plans to greatly improve the public transport network, and build both sidewalks and bike paths. It is especially noteworthy that Los Angeles is beginning to follow a different path, by setting up both light-rail and heavy-rail systems, as well as the BRT system. Several cities in the USA are now implementing or planning to adopt the BRT system.

Yet the American model still stands as one of the models for urban development in much of the world, as the following example illustrates. It should however also be noted that the successes of Bogotá, Columbia and Curitiba, Brazil are being duplicated in many cities around the world as well, from many cities in South America and North America, to Jakarta, Indonesia, and several other cities in Asia.

In many cases, municipalities end up waiting until it gets so bad, that something has to be done. Retrofitting a city to improve its structures and increase the modal shares of public transport and non-motorized transport* can sometimes be expensive (even if the only real way forward). The example of Bogotá illustrates that not only will they be spared such costs in the future, they have already saved a tremendous amount of money by not investing in a massive road building program, nor carrying out an expensive, limited-use underground mass transit system.

While this section has hopefully provided a clear picture of the relationships and the effects associated with providing any infrastructure for our cities – whether it be roads and parking spaces on the one hand or high-class mass transit options and biking paths on the other – the next section will go on to illustrate what actually happens when car-related infrastructure or road access is reduced, and towns begin to orient themselves towards a more sustainable and people-friendly pace of life.

It should also be noted that positive sustainable urban developments are happening in many places in the world, in both rich and less rich countries, which can be seen in Appendix B. A final example in this section comes from Groningen, Netherlands.

**Groningen – Europe’s bicycle capitol**

In Groningen, the Netherlands’ seventh largest city, the main form of transport is the bicycle. Some time ago, very high traffic congestion led city planners to dig up city-center motorways. They set about creating a car-free city center. Now
Groningen, with a population of 180,000, has the highest level of bicycle usage in the West. 50% of the trips in the city are made by bicycle. Since 1977, when a six-lane motorway intersection in the city’s center was replaced by greenery, pedestrianization, cycle ways and bus lanes, the city has experienced a remarkable recovery. Rents are high compared to the Dutch national average, the emigration to other parts of the country has been reversed and businesses, once in revolt against car restraint, are eager for more of it. As Gerrit van Werven, a senior city planner, put it, “This is not an environmental program, it is an economic program. We are boosting jobs and business. It has been proved that planning for the bicycle is cheaper than planning for the car.” Proof of this lies in the fact that requests regularly arrive from shopkeepers, requesting bans on car traffic on their roads.

The bicycle has become the focus of the city’s transport system. All across the city roads have been narrowed or closed to traffic, cycleways have been constructed and new houses built to which the only direct access is by bicycle. Out-of-town shopping centers have been banned. Cars are sometimes forced to take detours, where the cycling network contains the easiest access to the city center. This is achieved in part by dividing the center into four zones, with sector borders that can not be crossed by cars, thus there is no through traffic in the center.

Groningen’s ten-year bicycle program has averaged roughly €30 million, but every commuter car it keeps off the road saves at least €250 million a year in hidden costs such as noise, pollution, parking and health.

Cycling in Groningen is viewed as part of an integral urban renewal, planning and transport strategy. Separate cycle ways, advanced stop lines at traffic lights, and right turns at red lights are common. New city center buildings must provide cycle parking facilities. There are tens of thousands of parking spaces for bikes, either in street racks or guarded parking – the central railway station has room for over 3000 bicycles.

“We don’t want a good system for bicycles, we want a perfect system”, says Mr. van Werven. “We want a system for bicycles that is like the German autobahns for cars. We don’t ride bicycles because we are poor – people here are richer than in England. We ride them because it is fun, it is faster, it is convenient.”

Traffic evaporation – the concept

While new concepts often require some time to take hold and become widely accepted, this is slowly but surely happening in the science of road and traffic management. In the past, when a given road reached its limits as to how much traffic it could handle, the common response was to either
build a new road or widen the existing one. While this sometimes brought initial relief, it also brought puzzlement and frustration, since after not too long, traffic levels would come increasingly close to former times, and the local government would start to talk again about more road building.

But this has now been turned on its head. It has been getting more and more evident in recent years that if you build a new road to meet expected traffic flows, the very existence of the new road is a stimulus for traffic growth. This became clear, for example, when following the construction of the M25, the orbital motorway around London. People then also began to realize that while building new roads generates traffic, restricting access to roads actually decreases traffic. In a given situation, when roads have been closed, and access (especially to city centers) has been restricted, after the immediate changes that required some adjustment, the measurement of overall traffic volume for the given area reveals that there has been a system wide decline of traffic levels. This includes even those roads nearby to the closed off area, which were expected to become extremely burdened by traffic. This phenomenon has received the name traffic evaporation.*

It has been observed that when drivers are suddenly presented with a new scenario, and have to make a choice of which method to choose in a changed situation, then a shift to another mode of transport or even a reduction in the overall travel amount occurs. If public transport or cycling become easier in comparison to driving around a closed-off city center, for instance, the same person who before naturally reached for the car keys, will now think twice. In many cases, when the former convenience of a type of trip suddenly becomes less convenient, a frequent response has been to reconsider making the trip at all.

One particular situation has occurred numerous times: A road or even bridge was closed for the sake of reconstruction, during the reconstruction it was noticed that life seemed to carry on just fine without that particular artery, and so city hall made the decision to keep it permanently closed. Or in the case that it was later reopened, a perceptible degree of modal shift had already occurred, and the former levels of traffic were not again reached.

**First hand evidence**

An excellent body of research has been compiled, documenting this phenomenon in several European cities, and presented in an EU publication titled „Reclaiming city streets for people – Chaos or quality of life“. The very convincing research is leaned on heavily here, and several examples are quoted from this book.

Here, two examples are given, of Nürnberg, Germany and Strasbourg, France. It should be noted, however, that there are several other interesting examples in this study, ranging from the small Finnish town of Kaajani to a bustling neighborhood in London, England.

**Case study 1: Nürnberg, Germany**

**Background**

In the early 1970s, the city center of Nuremberg in Northern Bavaria, with its narrow streets, historic monuments and shopping areas, was facing growing problems of traffic-related air pollution, causing decay of historic buildings, health concerns, and excessive traffic congestion in the city center.

**The strategy: ‘Civilizing Urban traffic’**

Since the 1970s, the city authorities have adopted a progressive strategy to give priority to more sustainable, less polluting modes of transport, to provide better access to shopping and offices within the area, and to improve parking space management. The removal of car traffic from the city center was carried out in phases, culminating in the closure
of the last major traffic corridor through the city center between 1988 and 1989. Access for public transport was still permitted. In 1989, following wide ranging consultation and a close vote by the city, the pedestrianization was made permanent.

Over the next 10 years, the area has been transformed in six phases into an attractive pedestrian precinct, buildings have been renovated, street furniture upgraded and artworks introduced. The area has become a pleasant place in which to stroll and enjoy street cafés free from pollution and congestion.

Popular support for the pedestrianization scheme has been proved to be strong. Proposals to reopen the Rathausplatz/Theresienstrasse through road to car traffic following a change in political leadership of the city in 1996 were not realized due to public objection.

Results

First two months after Rathausplatz/Theresienstrasse Square closure to traffic:
- increase in traffic congestion;
- the municipality faced considerable critical opposition from the public and the media.

After 6–8 weeks
- traffic adjusted to the new situation and the congestion problems were resolved;
- support for the scheme grew as the advantages of the project became clear, especially in spring time when people could enjoy urban street life.

Extensive traffic monitoring was carried out to assess the impact of the road closure on traffic in the historic center. The actual traffic reduction (21 176) in the historic city center was twice as large as that predicted. By 1993 a total of 36 044 vehicles had disappeared and figures (although incomplete for 1997) suggest a further reduction in traffic levels. In order to see if the ‘missing traffic’ was being displaced to roads inside the outer ring road, screen line counts at the city’s 12 bridges were carried out. The statistics show that rather than an increase in traffic flows, there was an overall reduction of approxi-

mately 10 000 vehicles between 1989 and 2000, despite an overall increase in car ownership during this period.

The role of a brave leader

What is the role like of the town authorities, who are considering such aspiring goals? It is not always easy to push through with an initiative that does not at first appear very popular, but in the end, it can be quite rewarding. Here is an observation on the challenges that a city authority might face:

Taking capacity away from the dominant road user (i.e. the private car) is a brave decision for an authority to take. Logic suggests that if a network is already congested, the removal of capacity can only exacerbate the situation. Public concerns usually focus on predictions of traffic chaos and adverse economic impacts. In the face of such reaction, planning authorities and politicians may lose courage and abandon proposals to reallocate road space. In such circumstances new ideas, such as the concept of ‘traffic evaporation’ (which challenges the assumption that traffic congestion will necessarily worsen if road capacity is reduced), can lend valuable support as to the technical feasibility of creative traffic management solutions.

Case study 2: Strasbourg, France

Background

The city of Strasbourg situated on the banks of the River Rhine is characterized by canal and river crossings and historic buildings and monuments. The city center, located on an island, has been designated a world heritage site by UNESCO. During the 1980s, the city was facing growing traffic-related problems: frequent congestion, air and noise pollution, and high accident levels. The city center was becoming less attractive to visitors. In addition, the scope for providing more space to accommodate growing numbers of private cars was limited due to the historic street pattern with its monuments and historic buildings.
The strategy: The Urban mobility plan

The main aim of the plan was to reduce the dominance of the private car and to increase the use of more sustainable forms of transport, public transport, cycling and walking, in the city center.

In the early 1990s, a decision was taken to build two new tramlines serving the city center. However, in order to create the road space required, it was necessary to reallocate highway space from private car traffic to make way for the new tramways. The first step was taken in 1992, and involved the extension of the traffic free precinct in central Strasbourg for a trial period. This traffic free zone was subsequently made permanent and was further extended with the construction of Tramline B.

In addition, through traffic access to the city center, which represented almost 40% of general traffic flows, was removed. Access to districts of the city center and parking facilities has been made possible via a number of ‘loops’, however it is not possible to pass from one district to another. Through traffic is directed towards large boulevards on the outer circle or bypasses. Provision has been made for restricted local and delivery access in the heart of the city center. Parking charges have been introduced in the city center, resulting in a faster turnover, and therefore more efficient use of space. Cyclists and pedestrians have free access to all areas.

The first tramline, Tramline A, was opened in 1994, followed by Tramline B which was completed in 2000. Park-and-ride sites have been built along the new tramway lines, the parking ticket is also the tram ticket for all the parked car passengers. Provision for mobility impaired passengers has been made at tram stations and on tram trains. Opposition to the scheme was considerable, in particular from retailers in central Strasbourg. They feared that during the works to install the tram, they would lose business as access was reduced to city center shops, which did in fact occur. It was also feared that pedestrianization of the city center would prevent customers from visiting their shops as cars were prohibited from this part of the city. A strong anti-scheme campaign was mounted.

An extensive consultation process was undertaken with local residents, businesses and local associations, and an active awareness-raising campaign was undertaken by the city authorities in partnership with the transport operator. It was the first time that a French city of this size and importance had challenged its citizens’ habits to such an extent.

A communication strategy was developed, using magazines and local daily newspapers, (‘CUS’ magazine, ‘Dernières Nouvelles d’Alsace’) and posters displayed around the city. The campaign had a symbol, ‘Bruno’ the bear, which served as a visual aid during the project works. ‘Bruno’ guided car drivers and pedestrians around the road diversions, and he also informed them about how the works were progressing. A phone center was set up to deal with questions and complaints.
Results

In 1990, approximately 240,000 private vehicles entered Strasbourg city center; in 2000, this flow was approximately 200,000. Estimates suggest that without the implementation of the mobility plan, the number of vehicles would currently be 300,000. While it is not possible to estimate how much of this ‘missing traffic’ has displaced to other streets, it is clear that the strategy reallocating road space to other more sustainable modes has been successful.

• The predicted traffic chaos did not occur. After an initial settling-in period drivers adjusted to the new road layout.
• Public transport services have clearly benefited. Tramline A carried over 68,000 passengers/day during its first year of operation, and it is estimated that the tram led to a 17% reduction in traffic entering the greater Strasbourg area. Park-and-ride use has increased.
• There has been a significant shift in modal split from the private car to more sustainable modes: in 1989, 72.5% of all trips were made by private car and 11% by public transport; in 1999, 60% of all trips were made by private car and 30% by public transport.
• The number of trips made by bicycle has increased.
• The success of the strategy to date has provided the stimulus for a further two tramlines to be completed by 2010.

Resistance eventually turns to acceptance

It is only natural that citizens will protest to such measures at the beginning. They might be afraid of traffic chaos or simply of facing restrictions as a car driver. Shop owners especially become worried that they will lose business. In the case of the well-being of a shop, it is interesting to note that often a shop will do better once it finds itself in a carfree or traffic-calmed area. There are also some interesting findings, linking shopping habits with volume of traffic, which can be seen in the graphic about empty shops. But note also a conclusion from the above mentioned EU study:

In the majority of the case studies, planners and politicians have encountered opposition on two main counts: firstly that existing congested conditions will be made worse and secondly that retail trade will suffer. In some cases the protests have been very powerful. In each of the examples, a long period of consultation and extensive communications campaigns have been undertaken, in some cases lasting many years. At the end of this consultation period, despite opposition, the road space reallocation has gone ahead. In all cases, after an initial ‘settling-in’ period, the predicted traffic chaos did not materialize and a proportion of the traffic disappeared. The scale of the impacts on retailers is more difficult to judge; however in the majority of cases, trade has improved. The overriding motivation in all these examples has been a vision and commitment to finding more sustainable and socially inclusive transport solutions. The aim has been to improve the quality of life of those who visit, work or live in the city.

4 City Spaces

“The trust of a city is formed over time from many, many sidewalk contacts... Most of it is ostensibly utterly trivial but the sum is not trivial at all. The sum of such casual, public contact at a local level... is a feeling for the public identity of people, a web of public respect and trust, and a resource in time of personal or neighborhood need. The absence of this trust is a disaster to a city street... Lowly, unpurposeful and random as they may appear, sidewalk contacts are the small change from which a city’s wealth of public life may grow.”

-Jane Jacobs

The viability and the benefits of traffic evaporation* were presented in chapter three. Based upon this, we can make the case that the next step is to initiate a plan of traffic calming, with the goal in mind to provide the city residents with more space to play and move around, to reduce the ailments associated with pollution, to cut back on the number of traffic accidents, and to bring more quiet to the neighborhoods. The good news is that this is actually doable and that where it already has been
done, the results are tangible! This section will provide many different methods of traffic calming as well as suggestions for positive “filling-in” of traffic-calmed areas.

**Limiting car access to center**

Each and every town, no matter what size, can benefit greatly from turning their center into a carfree zone, with pedestrian streets, cafés, shopping districts and historical areas. This trend has become quite popular all over Europe as well as elsewhere in the world, that it almost needs no additional efforts to explain. Every year, numerous cities are added to the list of towns with largely carfree centers or extensive walking districts. Where this hasn’t happened yet, it is being planned. For the city that has not made such a move, this would be the very first place to start. For once the city center has been turned into a place where both local residents and visitors can stroll around, sit in cafés or shop, all to mere sounds of other strollers or perhaps a gurgling fountain, nearly every resident in the city will come to enjoy the benefits of a pedestrian center and will begin to spend more and more time there.

In the case of large cities or cities with an inordinate amount of traffic, the quickest possible solution for a city-wide reduction in traffic is to initiate either temporary or partial bans or set up a system of congestion charges. Banning cars from central areas can happen in different ways: One of them is to regulate which license plates may enter the city on what days. Several Italian cities permit odd-numbered plates to enter on certain days of the week and even-numbered plates to enter on other days. If owning more than one car is a common occurrence (or could turn into one), a way to prevent tactics for getting around the ban is by assigning the same category of license plates to the multiple vehicles of a single owner. This will also discourage drivers from purchasing a second vehicle for strictly that purpose.
Temporary bans on driving through the center might involve closing off streets for certain hours, for instance on evenings or weekends. The city of Bogotá, Columbia enacts a car ban on all the major streets in the center of the city, every Sunday, for seven hours during the day. A city might consider closing off certain streets every day after 7 PM, or perhaps for the whole day on either Saturday or Sunday, or both. Another possibility is to remove through traffic entirely, allowing only local residents to access their homes. A variation on this is to allow 24 hour access of a street for residents, but limit the times that other vehicles may enter.

Congestion charge is an option of charging a certain price for entry into the central zone, at any time of day. It has become well known that London, England implemented such a system, and this scheme has turned out to be wildly successful. Traffic in the center has been reduced by 18% and congestion by 30%. Many other cities around the world are now considering or beginning to implement a similar scheme.

**Traditional traffic calming**

There are a whole host of devices that can be implemented in a given neighborhood to limit the speed of vehicles passing through and decrease the appeal of driving in a given area. A speed bump (sometimes referred to as a sleeping policeman) is just the tip of the iceberg!

Apart from putting speed bumps in the road to slow down the approaching car, some of the other types of physical changes to the environment could include: Street narrowing or offsetting the center line, with obstacles on different sides. This might include a tree or protected group of potted flowers that jut somewhat into the road, so that the car must slow down to drive around it. The space given to the car is constant, simply the car must perform in an obstacle course, while moving down the street. A bottleneck is another type of narrowing device, where the entrance and exit to a street section has been narrowed, thus reducing the speed of traffic moving in and out.

In general, the use of both obstacles such as vegetation, painted lines or art installations can all function as traffic calming tools, and much room exists for creativity to be applied.

Road or entrance closures also work wonders. In this case, at a given intersection an entrance to a street might be closed to traffic, which turns the street into an effective cul-de-sac. Travel to this street will thus be reserved exclusively for local residents or occasional visitors. If the street is two-way, a partial closure would involve allowing only one-way traffic at one end of the street, while keeping both ways open at another. A two-way street might also be turned into a one-way street, adding either more sidewalk space or a bike line. If the principle aim for a certain street is to discourage through traffic, this could be done by turning different sections of the same street into one-way sections, however flipping the direction at various intersections, perhaps a middle section could be completely closed to all but bus traffic, by the use of electronically controllable movable barricade. This has been done for instance on Ráday street in Budapest, where buses can trigger the lowering of the barricade. In the city of London, there are many neighborhoods with one-way streets, dead-ends, and a maze-like structure of...
streets, that through traffic is next to impossible, and the residents are thankful for that.

It should be noted that the design of neighborhoods based on the grid scale*, as is the case of many sprawling North American cities, virtually turns all of the streets in the grid scale into through streets, meaning that few neighborhoods are spared of noise and pollution. The gradual organic development of city neighborhoods into non-linear ways, over time, appears to be the healthiest kind of development. If whole areas of town must be developed over a short period of time, it would be wise to pay attention to the outlay of streets, with the aim to create as many traffic-calmed areas as possible, as well as a sizable amount of high-quality pedestrian space, including also pedestrian streets and car-free housing. The less through traffic affecting the neighborhood, the better. This will need to be well integrated with public transport stops as well as bicycle and walking options, which is discussed in the next section.

**Slow zones, wide sidewalks**

Tempo 30 zones* have become popular in many neighborhoods over the past several decades. This is an addition to physical traffic calming devices in residential neighborhoods, where regulations are set for a tempo 30 on most of the streets in a certain area. Upon entering the area as well as at various intersections, large signs show that this is a traffic calming area. In Berlin there are even signs calling on drivers to keep to the speed of a pedestrian. If the sidewalk is flush level with the street (just a different color), and pedestrians are encouraged to feel comfortable walking across the street as they need to, slow moving drivers will be on even greater alert to watch out for pedestrians, thus making the roads even safer, providing the local residents with a feeling of safety and comfort in their community, and reducing the number of accidents.

Sidewalks should be as wide as possible, to enable pedestrians the opportunity to move freely in their neighborhood and to encourage pedestrian traffic to local destinations. While cars don’t necessarily need to travel side by side, people often like to walk side by side or in groups, and this can become quite frustrating if the sidewalk is too narrow to do this, or if cars are parked in such a way as to make this impossible. It is thus recommended for streets where the curb is low enough and the street architecture could potentially tempt a driver to park on the sidewalk, to erect bollards* – perhaps just the size of a small tree stump – to keep drivers to the edge of the sidewalk and allow pedestrians maximum use of sidewalk. There are various types of bollards, and if a nice variety is chosen, they can also have the potential to make a street even more attractive. Also grassy strips as well as painted colors on the street or sidewalk can act in a similar way to bollards.

**Reclaiming space**

In traffic-calmed neighborhoods, cars only really need slightly more than their own width, thus it is recommended to allot the space of the road that a car might use to the bare minimum, which will itself act as a traffic-calming device, since cars need...
extra room to go at higher speeds. The space regained will gladly be welcomed by both pedestrians and cyclists. In the case that about a meter to a meter and a half is freed up from what was already a one-way street, this can efficiently be converted to allow for counterflow* bicycle traffic. As we will later read about counterflow bus lanes, so bicycles can also safely travel in the opposite direction of car traffic. On busier streets, all that is needed is to paint a white line on the side of the road. Even this is simply for the comfort of the cyclist, as the mere presence of cyclists riding counterflow will cause drivers to be more cautious. However, in the case of traffic-calmed neighborhoods, where the speed of vehicles do not exceed 30 kph, it is not even necessary to create special bicycle lanes. These can however be added in the case of long distance bicycle routes, mixed neighborhoods with sometimes large flows of traffic, or simply just at intersections. Studies have indicated that counterflow bicycle traffic, if anything, will produce more safe streets than were there before. In any case, it is a highly recommended to add signs at the beginning of one-way roads, indicating that bicycles are allowed to travel both directions. This is especially to alert car drivers to the presence of other modes of transport that they will be sharing the road with.

Although it has been noted that car owners are famous for grumbling about losing parking space, in narrow historical neighborhoods (as for example the inner sixth district in Budapest), there is often so little space to begin with, that parked cars often take over the majority of the given space. For those people who do not drive, the space that both parked and moving cars take up is one of the worst punishments for simply living in the city. Where it could be possible, removing parking space on at least one side of a street could greatly increase the vibrancy of a neighborhood - either a bike lane could be added or the sidewalk widened, or both. In traffic-calmed neighborhoods, additional pedestrian space will bring the greatest benefit. Many streets are nowadays being refitted to accommodate more pedestrian and cyclist traffic. On a grand scale, a recent example of this is the Magenta avenue in Paris, where a formerly busy thoroughfare was converted into a traffic calmed street, with cycle lanes installed and ample extra space given to pedestrians. Another example is Seoul, South Korea, where a busy highway going through the center of the city was removed, and in its place footways and bikeways were installed, and an underground river was allowed to flow on the surface again.

A unique approach: Shared space

In the northern towns of Holland a special approach has been successfully tried in attempts to tame traffic. This approach is called shared space, and it operates on the principle that all of the modes of traffic must equitably share the given road space and become more aware of the traffic all around. This is done in the unique manner of removing all traffic signs, stop lights and other devices. While there is a certain element of traffic chaos that results with this, it inevitably becomes a slowed-down chaos, and results have shown a drastic reduction in traffic accidents. In places where vehicles averaged speeds of 60 kph, the new scheme has cut this down to just 30 kph, yet at the same time allowing for a more efficient navigation of the town, and there is no overall added travel time. This approach, developed by Hans Monderman, is now beginning to tried out in other countries as well, such as Germany and Austria.

Allowing creativity into neighborhoods

In neighborhoods where a concerted effort is being made to provide more quality space to pedestrians and cyclists, the possibilities could be explored to allow creativity full flow. This could involve, for instance, interesting foot and bike paths with lots of variety. This doesn’t mean that a bike path needs to make wide swerves and detours, to the annoyance of a cyclist who just wants to get from A to B, but it can involve creative ways and combinations of paths and path design, in some cases even with some variance from a straight line, as long as the
pavement is color-coded (usually red) or otherwise quite well-marked. Bike paths can, for instance, be built to go places that cars can not go, such as cutting through a road closure, or taking a shortcut through a narrow alley. One attractive opportunity for both cyclists and pedestrians is the maximum ability to utilize greenways* – paths moving through or adjacent to green areas, be it a forest or a park connecting urban settings or the use of space next to a defunct railroad, or perhaps the beautiful areas following a stream or river, or for that matter, any body of water.

The Australian transport specialist and author of “Reclaiming your street” David Engwicht has proposed a whole range of ways that streets can be turned into interesting and friendly places, by the means of creative methods of rearranging a street. His principle message is that before resorting to all of the expensive ways of changing the architecture of a street, many cheap and colorful ways can be explored, that allow for the involvement of the local residents in designing and creating these spaces. He has also noted that if only traditional measures are applied to reduce some number of trips, but if there is no positive, regained space to fill the gap, then simply more space has been freed up to eventually be consumed by other automobile traffic. Thus, to encourage a more permanent and positive change to take place, streets need to be reclaimed by making them more colorful and allowing for a bustling of community life and of exchanges.

Many of the ideas are as simple as adding color and objects to the street: putting different furniture or artworks on the street, hanging banners across the street, painting designs or patterns on the street. For example, an interesting sculpture or three-dimensional artwork in the middle of the road will both make this particular street more interesting for the pedestrian and cyclist as well as motorist, and it will also be a curiosity to cause the driver to slow down. It has been demonstrated that various colors and objects act psychologically on the driver, producing very noticeable results in a reduction of speed. Furthermore, the citizens of the neighborhood who worked together to recreate their street can also be proud of its new look and both enjoy being on the street more, while being safer at the same time. Where possible, it is good to change these on a regular basis, to keep things interesting, and to make sure the drivers won’t become too used to the obstacles. It is therefore also possible to combine the psychological component the art and designs with the physical components of objects in the road.

**Further steps**

If a town has already come a long way in providing quality urban landscape and sustainable modes of transportation possibilities – or if a rather auto-centric community develops the urge for a radical shift – then a next step can be to provide a larger carfree area, perhaps with the goal in mind to produce an entirely carfree center or even a carfree city. One device that several communities are employing as steps in this direction can be seen both the emergence of carfree housing – of which the Vauban district of Freiburg, Germany is one of the largest – or ecological city designs.
Carfree settlements within a larger city usually involves a new development, where compact houses are created without parking spaces or wide roads. Proximity to public transport is a must, as the neighborhood or housing area should have easy access to the town center and other transport hubs. Cycling and walking is naturally the most common way to move around in such communities.

There is also plenty of preparation work that has been created for entire carfree cities, of which a lot of credit goes to Joel Crawford, author of “Carfree Cities”. In such cities many compact neighborhoods are connected by rail or subway hubs, and moving between different neighborhoods has been made easy, without even the need for changing between different lines. While neighborhoods are compact enough to offer quality public transport, there is still a lot of green and open space, however divided equally throughout the neighborhoods. Freight can be taken care of on a smaller scale by carrier tricycles, or on a larger scale by freight trains. Since cars are generally not in use (except for emergency vehicles), there is a high quality of life and few problems with mobility issues. Neighborhoods have mixed uses, and most needs can be met without long trips required.

While not completely carfree, ecocities or dense, mixed-used city design, (as espoused by a movement known as “New Urbanism”), offer many improvements over conventional city arrangements, and make a concerted effort to reduce heavy traffic, reduce pollution and waste, and save on things like energy, and allow for rich community life. Some of the components that fit into such a vision are:
- accessibility for everyone
- city in balance with nature
- preponderance of short distances
- minimized energy consumption
- strong local economy
- built and managed with inhabitants
- public space
- favoring pedestrians, cyclists, public transport
- health, safety, well-being

More information on the different trends and possibilities for urban development can be easily found with the help of the reference section in Appendix 4. In most cases, representatives of the different trends and organizations listed are happy to be contacted and will be able to provide even more details than can fit here.

“*When I am travelling in a carriage, or walking after a good meal, or during the night when I cannot sleep; it is on such occasions that ideas flow best and most abundantly.*”

-Woodrow Wilson

An integrated transport picture

One of the most fundamental prerequisites for sustainable urban development and encouraging trends of sustainable mobility is by ensuring a high quality level of public transport. And when considering public transport, the first thing that should be established is that an integrated plan for public transport should be combined with an overall vision of getting around easily and safely in the community.
In order to achieve an integrated plan for public transport the term intermodality* offers a clue: By combining public transport means with walking and cycling possibilities, the overall functionality and attractiveness of the transport picture and available options are greatly increased. It is also important that various forms of public transport do not compete with each other, but complement each other. For example, if you have a train line that runs parallel to a bus line, you will be offering riders the best service if you present them with the train, for example, as the quickest means to move between intermediate and distant locations, and buses to transport the rider between short distances or to locations that are not served by trains. This is the standard practice in countries like Germany and Austria. Furthermore, local bus routes can act as feeder routes* to long-distance train service. This means that a rider might start a journey at a bus stop just around the corner, be transported to a train stop 1-3 kilometers away, and then ride a train for half an hour to an hour. Perhaps, to get to the final destination, the rider needs to use the bus again. If this type of a combination trip involving both bus and train is viable for a specific community, then the next step is arrange for a pricing and pass system that allows the rider to buy just one ticket or pass that is valid for the whole trip. This will both make the life of the rider easier and encourage greater use of public transport. Many cities are already using a city-wide fare card, that works on all types of public transportation.

Combining bicycle options with public transport is not something to underrate. A study in Chicago in 1980 found that increasing bicycle access to public transport was the most cost-effective way to reduce auto emissions, in other words to increase modal share* of public transportation use. In other words, if you make it easy for cyclists to use public transport, the popularity of public transport will increase. What are the ways of doing this? One way is to allow bicycles on as many different forms of public transport as possible. Bikes on trains are already very common practice in many places. In fact, some countries are even considering to allow bicycles on Intercity trains. Next, bicycles can usually fit onto metro trains fairly easily. Although, sometimes rush-hour restrictions need to be applied. But many metro systems, for example that of New York City, have allowed bicycles on the subway. Bicycles on bus racks is also gaining popularity. There are special bike racks that fit onto the front of buses and can hold up to two bicycles at one time. This setup is especially useful for bus routes that end somewhere outside of town, where there no further transfer options. This way, a twenty minute walk to the final destination can be converted to five minute bicycle ride.

**Trip Combinations**

We have already considered a full trip combining bus and train intermodality*. It might look like this:

1. local bus–train–local bus.

If we add bicycle use, then we get this:

2. bicycle–train–bicycle
3. bicycle–train–bicycle on bus

Another way to encourage intermodal types of transport is by installing bicycle storage facilities near to stations and major bus hubs. This should also happen together with providing easy access by bicycle and by foot to stops and stations. That way, cycling to a station, storing the bicycle and then boarding a train can become a common and easy practice for many people. Also, if the community supports a bicycle lending system, then even further combinations are possible.

4. walk–bus–train
5. walk–train–bike
6. bike–train–walk
7. bus–train–bike (lending/rental system)

It should become clear here that many different combinations are possible, and that the more that
intermodality* is stressed as a viable option in a community, the better the arguments are for people to choose an option that suits them, and then leave their car at home.

**Fair pricing for maximum use**

At the same time, to make these options really popular, it is best if prices are kept low. For instance, allowing bicycles on buses and trains will pay for itself, it is not needed to charge heavy ticket prices for such options. In fact, the possibilities will be most fully taken advantage of if the price for transporting a bicycle is kept to a minimal, or in some cases even allowed for free.

**Surface transport systems**

Surface public transport modes traditionally include buses, trolley-buses, trams, light-rail. This section highlights Bus Rapid Transit (BRT), bus lanes and light rail.

As can be seen with the story of Curitiba and Bogotá, BRT (see box) is one of the newer and exciting developments in the realm of public transport. In effect, a city can run an express bus system on completely separated bus lanes, reaching both the speed and level of efficiency of that of a conventional metro system, costing from 40 to even 400 times less the price of a metro line. In order for a BRT system to work well, attention must be given to ensure all of the necessary components: bus lanes must be completely separated from traffic, and boarding should be made from a special platform, insuring both easy access as well as convenience and style. Also, routes must be well chosen to serve the overall transport needs of the city and to connect with the other modes of transport. In the case of Curitiba, Brazil, per capita gasoline consumption was seen to drop by 30% in connection to the excellent bus service.

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### Bus Rapid Transit (BRT)

BRT is an excellent example of technology that was developed in the South, and has now grown to such an extent, that many countries in the north are both studying and implementing BRT systems. Its origins can be traced to Curitiba, Brazil, and together with Bogotá, Columbia make up the two most famous cities operating BRT, which have inspired dozens of other cities, in both the South and the North. The special attraction of BRT is that it delivers subway quality mass transit service at a fraction of the cost of a traditional subway system: Compare US$1 to US$5.3 million per kilometer (as is seen in Latin America), as opposed to roughly US$60 to US$200 for subway system infrastructure costs per 1 kilometer. BRT systems are able to achieve the efficiency of a subway system by operating on completely segregated busways, receive prioritization at intersections and employ rapid boarding, by use of elevated platforms. In fact, many stations are covered and even resemble a subway or light-rail stop, thus it is sometimes called a “surface metro” system. In Sao Paulo and Bogotá, BRT is able to transport over 35,000 passengers per hour. When Bogotá’s system is completed in 2015, it will serve 5 million passengers daily in a BRT network of 22 lines and 388 kilometers. Wherever BRT systems have been implemented, they have been so popular that additional lines are planned or already under construction within only the first few years of operation.

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In considering bus lanes, whether belonging to a BRT system or a conventional bus route, counterflow* bus lanes can be considered as a way to
prevent misuse by car drivers. Physically, what this means is that the bus lane carries buses going in the opposite direction that the general traffic is going. While this has been proven to be safe and work successfully, it carries the additional benefit of keeping cars out of the lane. The important thing to watch out for here is to ensure bus stops with easy access at street level.

Tram and light rail systems make up another alternative to building an expensive metro system. These can also be built at a fraction of the cost of a metro, and can carry more people than a bus. Light rail systems can be especially useful for connecting urban with suburban areas as well as quickly crossing unpopulated intermediate zones, such as is the case in Poznan, Poland, where trams rush through a greenway*, without stopping. It has also been noted that trams provide an atmosphere of vibrant street life. On streets where there is a certain level of commercial activity, if we add a tram, which produces a familiar jingle, and we add people waiting at a stop or platform, we get both a feeling of community and of general excitement enveloped in this particular urban scenery.

**Priority at traffic signals**

It is important to note the option of traffic light priority systems that can complement trams, BRT as well as conventional bus routes – in short, any surface transportation system. Traffic light priority for public transportation means that traffic lights are engineered to turn green for an approaching bus or tram, therefore minimizing dwell times* of public transport. This enhances the attractiveness of public transport to its users, and similar to a bus lane, creates the affiliation of a public transport offering an advantageous way to get around. This is already working in a number of cities.

**Predictability and frequency of service**

In order to facilitate a reliable public transportation network outside of large cities, it is advisable to ensure good connections between both cities and the
countryside. In the case of a smaller community that is not situated near to a train line, bus lines offer the best solution. Where possible, bus service should be reliable, frequent, and occur at regular intervals. For both urban and non-urban communities, predictability and frequency of service and the organization of arrival times are of paramount importance for both users as well as potential users. In an ideal situation, a bus or train user will not even need to check a time schedule, because service is offered at regular intervals: if a traveler knows that the bus will arrive at exactly :12 and :42 every hour, then the schedule can be learned quickly by heart and the user will mentally rely on the bus service for his or her transport needs. In the case of high population areas, a train going to a certain destination might come often enough that it is unnecessary to even think about the schedule, all that is needed is to go to the station and wait a few moments for the next departure.

In a smaller town, if it is possible to offer bus service on a particular route at just four times per hour, this can already give rise to a modal shift* in public transport use, as opposed to a frequency of service just once or twice an hour. That is because a user will most likely be willing to wait at a bus stop for an average of just five to ten minutes. However the same person might prefer the car, if the waiting time stretches to twenty or thirty minutes. The same holds true if the arrival time of a bus can be predicted, as opposed to having to consult a time schedule. The more frequent a public transport service can be offered, the higher the share of passengers can be.

Visible connections

In order for users as well as potential users of public transport to be aware of the possibilities, it is a great help if referential signs are placed in many locations. There are many different functions and many types of signs that can be made use of. Directions to train stations and train stops need to be clearly marked throughout the city. If there are special pedestrian or bicycle routes to access the station, this should also be separately marked. Bus stops themselves need to be highly visible, including information about the particular lines that serve the stop. Any potentially confusing aspect of a bus route or stop should be well noted, as well as the given transfer possibilities. Transfer options can also be presented inside a vehicle that runs a particular line. For example, a suburban train can highlight bus, tram or train routes connecting to different stops. Some trains and buses contain loudspeaker systems which announce transfer options.

Visitors to a town will be especially happy to find descriptions of popular destinations, and the formula for getting there by public transport. For example, tourist sites, shopping areas, parks, zoos, train stations and major transit stops can all feature information boards describing both the possible routes as well as the time required, to move between these different points. To make it even more interesting and attractive, local artists can be consigned to come up with a design for such boards, instead of just ordering from a traffic sign manufacturing company.

Economic benefits of planning for cycling

I-ce (a Dutch bicycle consulting organization) calculated the economic value of planning bicycle facilities in four cities, one of which was Bogotá. The costs of building bicycle tracks, their maintenance as well as promotion and education campaigns were calculated to be US$186 million over a period of 10 years. The construction costs of one kilometer of high quality bicycle track were about US$200,000. Cost savings from reduced infrastructure needs, reduced congestion and reduced pollution due to the replacement of car kilometers over 10 years amount in total to US$493 million, of which more than 50% results from saved parking spaces. Road safety is expected to be improved by 50%, based on experiences abroad. This results in savings with an economic value of US$643 million. Savings in running costs for road users by not using a car or a bus amount to US$167 million. The overall result is that the benefits have an economic value of US$1302 million over 10 years, compared to US$178 million costs. The benefits are 7.3 times higher than the costs. (For further information visit: www.cycling.nl; The Economic Significance of Cycling; VNG/I-ce; The Hague/Utrecht; 2000. Taken from GTZ Sourcebook on Sustainable Transport, Module 3d).
The concept of sustainable mobility goes beyond mere dealings with traffic flow and transportation options. While it does include these, it bears a wider definition, including the whole relationship we have to our cities and our social structures – not in the least our pace of life, which is affected by both our travel decisions, the economic backdrop of our society and the total amount of our energy and time spent on moving ourselves. An overarching goal of sustainable mobility is to achieve a sustainable society.

To envision and then work out a concept of sustainable mobility for a particular region means to take a holistic approach to all of the issues present in a society related to movement and the quality of life. If municipal leaders, transport managers and others involved in the life and development of a city are able to see how all the individual parts fit into an overall whole, and are therefore able to take a unified approach to dealing with the various issues, then this can be considered integrated mobility management. And if conducted in a way to provide the highest good for the most of its citizens, with an eye to maintain a town as a pleasant, calm, easily navigable and fun place to live, then the concept of sustainable mobility is being used, and the town has every reason to really bloom.

**Integrated mobility management**

Mobility management encourages travelers to use the most efficient ways of getting around possible. It both regulates and reduces car usage (for instance for short trips) and makes sure that sufficient, efficient and multiple alternatives are available for travelers, and that furthermore these work together in a unified system. There are many potential strategies (several of which have been mentioned in sections four and five), ranging from improving transportation diversity, providing incentives for users to alter the mode, frequency, route or timing of travel, and to working with more efficient land use and urban layout.

Todd Litman of the Victoria Transport Policy Institute (VTPI) is a chief architect as well as advocate of mobility management. His institute has developed an online Transportation Demand Management (TDM) encyclopedia, which presents many of the different strategies for making more efficient use of transportation resources. The use of these strategies can have multiple benefits, such as congestion reduction, road and parking facility cost savings, road safety, environmental and air quality, consumer savings, more efficient community and land use, and several others. Mobility management can thus provide both significant savings to consumers as well as to the municipality’s budget. The underlying principle is that the results will benefit society as a whole and also increase the quality of life.

As the total benefits of mobility management surpass individual solutions that only address one or a
few problems, it is worthwhile to illustrate this in an example: Improving transit service (by expanding a rail system or modernizing a bus fleet for example) might alone reduce urban automobile travel by 5%. If one were to only implement a smart parking management system, this itself might reduce automobile travel by 5%. Yet if one implements a program where both of these strategies are used, it can very well result with a reduction in automobile travel by 15%, as both a combination of positive and negative incentives were used.

Without careful management, automobile traffic regulates itself in rather inefficient ways. What results are congestion, parking problems, accidents, lost time and lots of lost money. With a careful and integrated approach, following a least-cost planning stratagem and efficient mobility principles, much can be gained. If on the one hand, we take into account the amount of comparative space required for different modes of travel (see space used comparison box) as well as safety considerations for shared use of space by different modes of travel, then we can come up with a priority list that can be effective in mobility management (developed by Litman):

1. Emergency vehicles/trips
2. Walking
3. Cycling
4. Public transit
5. Service/freight vehicles
6. Taxi
7. Single occupant cars
8. Automobile parking

When there is a conflict between different modes, then prioritization rules should apply. Using this as a rule of thumb can also serve to encourage the social set of values of a community, reflecting environmental and health awareness as well as consideration for others in the community (acknowledging the fact that some modes of travel can be potentially injurious to others, which is to some extent true as we follow the list from the bottom up). All of the members of society make up a community as well as a living traffic organism, and must thus learn to coexist not only efficiently but also peacefully.

**Space used by different modes of transport**

To transport the same number of people (in this example 72) by bus requires 30 square meters, by bicycle 90 square meters, and by car 1,000 square meters. This was shown by the Münster, Germany city council, in public campaign to illustrate the efficiencies (or lack of) of different modes of transport:

- Bicycle: 72 people are transported on 72 bikes, which requires 90 square meters.
- Car: Based on an average occupancy of 1.2 people per car, 60 cars are needed to transport 72 people, which takes 1,000 square meters.
- Bus: 72 people can be transported on 1 bus, which only requires 30 square meters of space and no permanent parking space, since it can be parked elsewhere.

**Slow cities, Decroissance and the pace of life**

If we want happiness, beautiful local surroundings, a comfortable pace of life, and quality urban areas to be our principle goals when making decisions about transport, mobility, urban fabric and the economy, then we would do well to also re-examine the current trends in development and ask ourselves what kind of growth is the best for us, what processes to modify or cease and what processes to give an even stronger support to.

In various parts of Europe new movements have sprouted up, which call into question the need for an extremely fast-paced life and hypermobility, and invite people to consider a more people oriented, calmer pace of life. In Italy, this started as the Slow Food movement, which was a direct response to fast food, but developed further to embrace more parts of life, and eventually gave birth to the Slow Cities movement, which now include 100 towns in ten countries, that have signed the Slow Cities charter and attempt to promote those activities and functions of a city which aid to the enjoyment and celebration of culture and of life.
In France, a movement has been on the rise called Decroissance, which implies a concept of anti-growth, or better expressed, of slowing down. The advocates of Decroissance don’t so much suggest that human civilization should revert to the stone age times, but rather that instead of putting so many people into situations causing them to consider a resemblance of chickens with their head chopped off, that we should rather be living in ways where we might slow down and enjoy life as it passes by, instead of trying to go ever faster, and push economic growth and top speeds at all cost.

**A city of short distances**

The proponents of slow cities or Decroissance, when talking about slowing down, are mostly interested in being able to guarantee a quality level of life, where they don’t have to always feel like there is a need to rush around everywhere. One of the issues at the core of the concept of sustainable mobility has actually little to do with the type of transportation, but rather the need to make a trip in the first place, as well as the length of trips. It is here that the size and arrangement of cities play an important role.

Let us imagine for a moment that in the past, entire cities were composed of a castle and small settlements nearby, or perhaps a medieval city, with a small center surrounded by the city wall. In these very compact cities everything was very easily reachable by foot, and people spent relatively little time in transit.

While most proponents of Decroissance or Slow Cities are not suggestion that we embrace a medieval lifestyle, they are nonetheless claiming that we can arrange our cities in ways that most of the things we need are close together, and therefore we shouldn’t have to travel so much on a regular basis. Included in the concept of a compact city is that of mixed-use neighborhoods, where we can live, find work places, take care of errands, and have entertainment and recreational possibilities, all within
proximity of each other. This vision has also given rise to the term walkable cities, which implies that naturally most of our destinations are nearby, and where they are not a bicycle should do the trick. New Urbanism, also mentioned in section four, is one of the proponents of compact cities. But so are most other similar movements, such as Eco-cities or carfree cities.

In a survey conducted in Australia, the top two things that those asked said they would like to see happen in their city in the next twenty years were more convenient placement of facilities, such as just around the corner, and an increase in human contact. Both of these are adequately dealt with in a compact city or walkable community.

It has already been noted that one of the problems with sprawl and city areas that cover a large area, are that the necessity for large trips always rise and that automobile dependency becomes hard to escape. People will spend a great part of their day one the way to somewhere, and the possibilities for human interaction become limited. It is noteworthy that in the USA, where the greatest levels of sprawl have been achieved, that the problems associated with this are becoming better understood, and that in a growing number of cases, cities are beginning to counter these trends.

An integrated method of managing transport demands, together with an intelligent way of organizing urban places, thus leads to sustainable mobility, where perhaps the same types of activities can be engaged in, as say a large, sprawling city, but with much time saved and a more relaxed pace of life.

"Knowledge can produce better machines, or help us live longer. But it is useless in helping us create a more civilized and compassionate society. For that we need wisdom.”

-David Engwicht

In this final section, we take a step back, and look at the bigger picture of a city and how it operates. Once we have worked hard on developing a sustainable transportation network, we should also consider the different factors that add up to a city being sustainable, which means that it has inherent values respecting both environmental ideals as well as including people’s satisfaction and well-being in the highest priorities. Included in this discussion is necessarily also the local economy, as this must fit the needs of the population and add to the well-being of its citizens. The social dimensions and the creativity inherent in the populace, when allowed to flow, will definitely fill a town with vibrancy and bring enjoyment to both residents and visitors.

The life and economy of a city

For a city to be dynamic, full of life and contain satisfied and happy citizens, the quality of urban structures, public spaces and places of exchange must all be fostered to create the best situations for the most people. This includes meeting places, public spaces, pace of life, and quality and diver-
sity of exchange opportunities. A part of this is naturally also a healthy local economy.

Considering for a second the concept of exchange, we find that all sorts of interaction on the street and in public places fit into the category of exchange, as do shops and vendors. When people meet in a public place, engage in conversation and share information, this can be considered an exchange. But also buying and selling things are forms of exchange. A thriving and creative city provides many opportunities for exchange, in all of the public spaces, buildings and markets of the city, and the better the conditions for meeting others, be it planned or accidental meetings, the greater the social network, and thus the creative capacity of a city becomes. David Engwicht argues that it is precisely the unplanned encounters that make a city both enjoyable to live in and increases its potential for creative expression and for a healthy participation of citizens in public life. These kinds of unplanned meetings are most common in areas with lots of quality pedestrian space, wide sidewalks, or generally places that people are attracted to congregate in. On the other hand, these types of situations are most notably absent in very busy thoroughfares or sparsely settled suburbs, which most people only enter and exit while on the way to and from home.

Keeping this in mind, we should next look at how an economy plays a role in the life of a city. If we consider a whole city an „economy of exchange”, and we would like to find out how an economy and a city can both be run in a sustainable way and fulfill their roles in adding to the citizen’s well-being, then we need a specific answer to the question: „What is the economy’s role?” David Engwicht provides us with this answer:

What is the ultimate goal of an economy? It is certainly not to simply produce ever increasing GDP (Gross Domestic Product) figures. It surely must be to increase the utility that citizens derive from being part of a collective enterprise. Utility is not the same thing as consumer goods or money in the bank. Utility is the ability for some commodity or social arrangement to enhance our quality of life. A consumer good has no utility unless it enhances our life in some way. The exercise machine gathering dust in the attic may have added to the GDP, but it is not adding one ounce of value of the quality of our life.

The other day I walked past a bakery with a friend who is an astute business woman. Behind the counter was a young girl with a smile that oozed warmth and welcome. My friend commented that the smile was worth a million dollars. Now the bread from this bakery may cost the same as bread from other bakeries. But you get more than bread at this shop. You get a smile that lifts your spirits. The good feeling you get from this young girl’s smile is „utility”. It is intimately bound to an economic exchange, but there is a value in that smile that cannot be measured in the GDP.

...Economic strategies for cities must carry the same goal as transport and urban design strategies: increasing the efficiency with which diverse exchanges can be transacted while at the same time increasing the utility inherent in those exchanges. The economy is not therefore some external reality. It is intimately bound into the totality of our life. It certainly is not just the exchanging of money for goods and services. The „economy of exchange”, facilitated by the city, is an old person on a seat supervising neighborhood children playing in the street. It is the listening ear offered by the butcher. It is the street busker. It is the eccentric on the milk crate playing a tin whistle. It is the increased variety of restaurants in our district.... It is the stranger who tells us tales of exotic places. It is the street wisdom we gather from our elders. The health of an economy must be measured by how well it is facilitating these diverse, life-enhancing exchanges.

It is therefore of utmost importance to always maintain a vision for an economy to serve the population and the quality of life in the first place, to be able to provide end results that have real meaning and go beyond simply growth for growth’s sake or the maintenance of certain practices that might somewhat influence economic growth indicators or perhaps provide a relatively small portion of the population with greater affluence, but does not really contribute to the overall well-being or happiness of society at large.
Local economy, local business

It has been noted in many places that a healthy local economy is the most important backbone for a city to thrive and to be able to support its activities. A local economy is composed of both local businesses and job opportunities that are available for the residents of the area.

Local businesses will be the most familiar with a local area and its particular needs, and will thus be in the best position to contribute useful things to a community: commercially, socially and culturally. Local residents who make use of local businesses will then also profit doubly by their consumer’s choice: The money that they spend in the local economy will, for the most part, stay in the local economy and benefit them in the long run better.

This can be understood when we consider that a local shop with locally hired employees are most likely to re-circulate their profits in the local area and will possibly also support local artistic and cultural items. Large inter-regional or multi-national businesses, while providing some jobs for the local region, will probably only feed a limited amount of their profits into the local economy.

Creative wealth and altruism

A further indicator of what makes a city more livable and also more interesting is the level to which the citizens and residents of a city themselves add to the makeup of the city and to its creative workings. This includes drawing from the creative talents to produce a rich and interesting cultural and social life, as well as capitalizing on the help and altruistic nature of the citizens to create both a strong social net as well as building a friendly and helpful society, in which it is a pleasure to dwell in.

Chris Cunningham has argued that it is the „altru-
istic surplus” of cities that make one city more livable than another. By altruistic surplus it is meant that people perform tasks that benefit others without receiving a benefit to themselves. It is when a society takes its own social and urban issues and problems very seriously, and attempts to not just influence local development for the better, but also get physically involved, that society as a whole can benefit from such a level of participation and goodwill.

David Engwicht has analyzed this, and remarked that while there is often an assumption (perhaps on the side of a town’s authorities) that citizens are basically selfish and are not very inclined to add something to the communal good, it can be this very assumption that stands in the way of a greater exploitation of what Engwicht and others refer to as “social capital”. He goes on to assert that while humans can be both selfish and generous, that if we build upon and environment of goodwill, it will very naturally stimulate further goodwill and create an environment in which people tend to be more giving: “Cognitive psychologists tell us some interesting things about altruism – it feeds on itself. If you create an environment in which it is the norm to give to others without expecting a payback, then the levels of altruism rise. Unlike money, the more you spend the altruistic surplus, the more you have to spend. The great thing about tapping altruism as a way of solving problems like traffic is that it not only helps get the problem solved, it also increases the size of the altruistic surplus which can then be tapped to help solve other problems.”

It is becoming more and more common these days to draw directly upon both the talents and the desires of a population when the task is to shape the environment that they work in. If for instance a new area is being developed with residential buildings, and the future inhabitants are able to have a say in what the outcome should look like, then this is called user design*. Ideally, the group of future neighbors will get together, take a close look at what the conditions are of the site, discuss what the important items are in the construction process, and even make maquettes (scaled models) of the area under consideration. Similarly, if the issue at hand is an existing neighborhood, and a group of local residents would like to both see traffic-calming and a beautifying of their neighborhood, this also provides an excellent opportunity for civic participation in the improvement of a community and simultaneously the community’s social bonds.

A wise city official will see the benefits of allowing the citizens to add to the overall betterment of a community, and in some cases even help to facilitate citizen involvement. This has the double effect of making a city friendlier and more livable as well as putting more people to work and achieving more results.

The magic and charm of places

Putting aside for a moment all of the particular details that add up to make a city work well or more sustainable, we shouldn’t forget that one of our goals is simply to be able to experience places that makes us feel good, places that are beautiful, and that can provide us with special moments. While ultimately every town and city will come to its own conclusions in how to handle the issues and spur positive developments, it is however often a more abstract assessment or subjective experience that defines whether or not we are attracted to a place and if we feel good being there. Thus, it often goes beyond the financial side of things or the always shifting political and economic factors, that provides a place with vitality and with charm. While the magic or good feeling of a place can not be simply be created according to a blue-print, where beckoned and appreciated, it does a community a world of good. To enjoy and esteem the enduring qualities – be they surrounding elements of nature, cultural and artistic heritage or the traditional aesthetic and architectural elements – together with a dynamic creative wealth and a feeling of local pride and satisfaction, allow a place to emanate magic and bring joy to the streets.
The sustainable city

Much of this book has focused on the traffic and transport related issues that do in fact make up a very large portion of the day-to-day issues in any given city. Being able to choose and implement some or many of the suggestions made here will undoubtedly lead to a more sustainable city. If we start with a limitation on the amount of automobile traffic, move on to reclaiming and beautifying streets and public places, increase the sustainable forms of travel, such as walking, cycling and public transport, and then support those measures that make a place both lively and also calm enough to enjoy life in, then we have gone a long way to making a sustainable city.

Thus, the realm of transport is one of the greatest urban factors in determining the quality of life and the livability of a city. If a city and its citizens strive to operate their communities in the most sustainable ways possible, this will naturally involve other factors as well. While these factors go beyond the scope of this book, they do deserve to be mentioned and they should be seen as necessary components to an overall sustainable city. For instance, while urban traffic does in many places produce the bulk of a city’s pollution problem, factories and other industries can also pollute, and thus also need to be regulated, with the goal of bringing the overall pollution levels of a city to the absolute minimum possible. Waste management is another area that deserves special attention, and the maxim of reuse, reduce, and recycle is as important today as it ever was. There are more and more organic products and services that are available as real (and increasingly more affordable) alternatives to conventional products or ways of doing things. Energy supply and maintenance is a quite large factor in the organization of a city, and here, too, there are many opportunities for instituting environmentally friendly and renewable resources: Wind energy, solar energy, and biomass are all a part of the greening of energy, and are set to play an ever greater role in the energy sector.

The realm of transport and mobility, as well as the areas mentioned above are all worthwhile places to work for change in and to play a role in creating more sustainable communities. Yet at the same time, when considering the various ideals and then the current situation, it might sometime seem like the gulf between the two is so large, with so many areas where progress is needed, that one can get plain overwhelmed with it all. It thus merits an acknowledgement that even if there are many big tasks at hand, there is no reason to become unnecessarily discouraged, for even just concentrating on a few areas for improvement can allow the way for positive change to take place and for a community to set forth in a direction that will see positive benefits, even in years to come. It is sensible then to draw up a strategic plan, that together with a timetable and a set formula for implementation, can evolve into a realistic program and gain a momentum that brings with it real results. Reiterating what was stated at the beginning, it is after all first and foremost the will to see something happen, that can make it all possible.
Here you can read many different ideas and mechanisms that can be implemented in towns to encourage sustainability. Both hard measures (related to infrastructure changes) and soft measures (mobility management programs and incentives) are discussed here. Several items you will recognize as having appeared in the pages of this book but there are also suggestions that appear only here.

Regulating traffic

1. Reduce/remove cars in the center of the city
   Several options are available: Cars can be banned entirely from a certain area, which is then turned into a pedestrian zone. Car access can be rotated, where certain license plate numbers receive access to the city center only on certain days of the week. Congestion charge is where any car entering the center must pay a fee.

2. Traffic calming
   There are many ways to provide traffic calming in neighborhoods. Whole neighborhoods can be declared tempo 30 zones. Streets can be narrowed, widening sidewalks. If streets are made to be curvy and not completely straight, perhaps with the help of obstacles, such as flowers or small trees, traffic will move slower. Bottlenecks make cars slow down at intersections.

3. Car access limitation
   Even where cars can enter central areas, it is possible to divide the center into zones, where cars can not move between zones. This eliminates through traffic. Certain streets can be blocked off at one end, which has a dramatic traffic calming effect.

4. Parking policy incentives
   If parking space is limited or expensive, this will discourage traffic. Increasing parking fees will produce immediate effects. Removing some parking, such as parking spaces on one side of the street, will add to public space. Where not much parking space is available, this acts as incentive for using public transport or walking and cycling. Parking policies should be guided by the principle of the most efficient use of space that is also the least obstructive to the eye and consumes as little public space as possible.

5. Road and fuel pricing
   Fuel pricing should both reflect the real cost of fuel as well as the fact that fuel supply is gradually but surely running out. High fuel prices ensure that only the most necessary trips are made. Similarly road pricing schemes, where certain or most roads stipulate a user fee, have the effect that individual trips are carefully thought out and only occur when there is a real need.

6. Regulation enforcement
   In order for any policy to be effective, it needs to be well-enforced. If infractions are common, then a policy will not be very effective. While there are many different methods for dealing with enforcement, it should be noted that...
preventing infractions is much more cost-effective than punishing infractions, although such a system should be in place as well.

**Improving community design**

7. **Visual improvement of neighborhood**
   Traffic calming measures and other traffic reduction policies can also be accompanied by making neighborhoods more attractive and homely. This could involve producing well-designed arches and entrances to certain streets and neighborhoods. Special paving and colorful sidewalk designs can add a lot to appearances, as well as to the traffic-calming effects. Trees, plants and public exhibitions or artwork will make a neighborhood more interesting and inviting.

8. **Attractive streets**
   Where the intent is to make a neighborhood lively and interesting, mixed neighborhoods, with a variety of shops, restaurants and theaters mixed into residential areas, will provide for liveliness. To encourage pedestrian activity, there should be interesting things to look at, convenient shortcuts, and a wide range of destinations to choose from. At intersections with traffic lights, pedestrians need to be given plenty of time to walk across the street, considering also people who walk slower. Neighborhoods with lots of pedestrian activity will also feel safer to be in.

9. **Greenways**
   Strips of forest, park or land surrounding water can be turned into very attractive places to move through by bicycle or foot. Greenways connect different parts of a town or offer a green corridor leading out of town. Waterways, lakes and ponds can all be enjoyable places to spend time nearby, and usually have adjacent areas that are excellent for bicycle paths and walkways.

10. **Rivers, ponds, canals**
   The presence of water adds beauty and richness to a city. Ponds and rivers should receive a great amount of attention and be very accessible. Waterfront areas, if close to urban centers, provide ideal pedestrian environments and usually great views. In some cases, small canals running on the side of urban streets produce a comforting sound and provide for a pleasant atmosphere. Such a canal, if placed between road and sidewalk, can even be as small as a meter across.

11. **Places to congregate**
   Benches and other physical objects that can be sat down on should exist throughout any city. Benches and chairs allow for people to sit down, chat with neighbors and have picnics, just to name a few. Where there are several benches in one location, they should be able to face each other. Loose chairs can be very convenient for people to rearrange them according to need. Physical objects, such as terraced stone or concrete formations, steps and other architectural objects and sculptures can all provide for places to sit down and enjoy the surrounding environment.

12. **Encourage compact development**
   Compact development means that a city maintains higher density areas with commercial and transit areas all being closely linked with population centers and easily accessible. Mixed neighborhoods allow for most of the needs of a resident to be found nearby, including work places as well as shopping and recreational areas. At the same time, it is wise to prevent an unlimited growth and sprawl of a city. Allowing numerous shopping centers to be built on the outskirts of a city will pull people away from the center, and generally increase travel times, as well as weakening the attractiveness of the central locations.

**Transport infrastructure**

13. **Intermodal public transport systems**
   The best public transport system integrates the different types of transport, such as metro, light-rail, trams, long-distance buses, city bus routes, and also cycling and walking. Transferring be-
between different modes of transport should be easy, with stops nearby. System-wide fare cards (one pass for all types of transport) encourage intermodal use. Bicycle parking facilities should also be located at train stations and major transit stops. Bicycle racks can also be placed on the front of buses, especially those that cover long distances or end in remote areas.

14. High quality of service
High quality and service along with an updated infrastructure will invoke trust on the part of the populace and increase modal share* of public transport use. With a sufficient frequency of service, people will be more likely to rely on public transport for their transportation needs. Tickets should not be too expensive and transfer options should not be priced high, if at all. Public transport should never be more expensive than the use of the private car and price reductions and frequent special offers will provide incentives for use.

15. Separate busways
Busways separated from the rest of traffic will increase the speed and efficiency of buses to move passengers. This is especially useful in areas where traffic jams are common. Bus rapid transit is an extension of this idea, where a whole network of bus lines running on separate busways can run at a level of efficiency near that of a metro, for a fraction of the cost. Separate busways can also run counterflow to the rest of traffic. This will also insure that there are no infractions.

16. Prioritization of traffic lights
At intersections where buses, trams and light rail cross, prioritization should be given to these modes of transport. By means of electronic sensors, lights can be made to turn green for the oncoming tram. Thus, surface public transport will only rarely need to stop, apart from loading passengers. This increases efficiency of the whole system.

17. Regular Maintenance
It is important to maintain the quality and upkeep of areas or services used by the public. For instance, bus stops and cycle paths need regular maintenance and quality checks.

Planning and soft policy strategies

18. Planning for children, elderly people, the disabled
While these are quite separate groups with their individual needs, nonetheless transport planning should take into account people with special needs. Disabled people require handicapped access to transport facilities, which includes the possibility of boarding buses via a slide ramp, or descending to metro level via a special elevator. Children and elderly people will need more time to cross crosswalks. Children need to be guaranteed safe sidewalks to walk on, without major sight obstructions, especially where there are places to cross streets or where traffic might come from. Elderly people, as all others, will benefit from frequent locations of benches.

19. Planning for tourism
If a town frequently receives tourists or has tourism potential, it is important to provide the necessary amenities for out of town visitors. As tourists frequently do not come with a private car, it is necessary that there are public transport options available between main transport hubs (such as train station and airport) and principles sites and the downtown. Information related to transport and finding one’s way around town should also be listed in one or several international languages. It is very useful to post town maps in public areas and at bus stops and train stations. Long distance bike routes also have great tourist appeal.

20. Tax and subsidy reform
Tax systems should benefit municipal services and especially public transportation. Road taxes, automobile taxes and environmental taxes should all be made partially available to increasing the efficiency of the public transport system. Municipalities should also insist that state or regional subsidies do
not provide an unbalanced support of automobile infrastructure, as this will have less beneficial effects on a community than if adequate public and non-motorized infrastructure is equally supported.

21. Public outreach
When a municipality introduces new changes and makes improvements in a city, it is very important to publicize this by publishing brochures, articles in the newspaper or other publicity campaigns. This way, citizens will be well informed about changes in their community, and they will be able to see what their municipality has done for them.

22. Phone hotline and website
Further, residents and visitors need to have a way to communicate, ask questions, or complain to the municipal authorities and transport providers. This can be via a hotline phone number (best if free of charge) as well as a website. All important travel information and changes should be regularly updated on the appropriate websites and be available over the telephone.

Further ideas

23. Carfree Days
A city can designate a certain day to be the regular carfree day of the city, where cars are banned from major streets or even altogether from the city. This can either happen once or several times a year, or more ambitiously every Sunday or weekend. During a carfree day, main streets are closed to cars, and the citizens will enjoy walking and riding all over town. Public transport should still run as usual. This is also an opportunity to allow for the festive spirit and stage community events and programs. It is especially recommended to observe the World Carfree day, on September 22, every year.

24. Walking school bus
Known also as traffic snake, the walking school bus is an organized way for children to walk together to school, along routes where schoolchildren live and can join the other children for a safe, communal walk to school. In some cases a parent or another adult will be able to accompany the walking school bus.

25. Carsharing
Carsharing is an option for certain communities where there is a need for occasional but not frequent car use. Carsharing clubs may be set up where a number of cars can be used by participating members, thus providing a private vehicle option for certain occasions, yet each citizen does not need to possess their own car. Carsharing both saves money and provides for a more efficient use of resources.

26. Rideshare board
A rideshare board is where drivers going on a trip can make their trip information accessible on a website or through a rideshare center. The driver will this way be able to pick up travelers going the same direction, share fuel costs, and make the most efficient use of the vehicle. Rides can be announced both in an electronic medium as well as a public notice board.

Appendix B: Best practice highlights from around the world

This appendix lists just a few of the places around the world that have accomplished or are in the process of bringing about exciting developments in increasing their city’s sustainability and attractiveness. These cities act as examples to all and illustrate the many kinds of positive developments that are possible.

1. Groningen, Holland: For a part of the world with high vehicle ownership, Groningen as one of the highest modal share of bike usage, averaging 50% of city trips. This is thanks to an aggressive bike-friendly policy by the city authorities, beginning in the 1960s and 1970s.
2. Curitiba, Brazil: The birthplace of the Bus Rapid Transit system, this city is seen as a very sustainable city in many respects. Its visionary mayor, Jaime Lerner, is greatly responsible for this. With a population of over million people, there is an extensive pedestrian area, including 49 downtown blocks.

3. Venice, Italy: The showcase carfree city. This beautiful and historic carfree city illustrates the great tourist potential of carfree cities.

4. Fes, Morocco: In the medina of Fes, which is a UNESCO world heritage site containing high walls and small streets, over 150,000 people make their home, thus it is the largest carfree area in the world today.

5. Bogotá, Columbia: For a large capital in the developing world, Bogotá can be proud of amazing achievements: A first class, world famous Bus Rapid Transit system, a large network of cycle paths and weekly celebrated carfree Sundays.

6. Freiburg, Germany: The Vauban district in Freiburg is the largest new carfree development project, illustrating both a great demand as well as potential for carfree residential areas.

7. Seoul, South Korea: A six lane highway was converted to public space, river, foot paths in the downtown of the Korean capitol.

8. Copenhagen, Denmark: This is another very cycle-friendly European city, with an extensive network of bicycle paths, and a 36% modal share* (and growing) of getting to work by bicycle. Copenhagen also has a world-famous free bicycle lending system in the city center.

9. Graz, Austria: This city was the first to implement a city-wide speed limit of 30 kph for all neighborhoods. This has shown a dramatic drop in accidents. The mobility center in Graz contains lots of useful information for its citizens regarding public transport, cycling and walking.

10. Fresno, California, USA: To combat an already exacerbated sprawl problem, this city has instituted legislation to prevent further sprawl by charging high fees for new developments beyond current built-up areas.

11. Paris, France: The city recently converted a major boulevard (Magenta) into a traffic-calmed street with greatly improved pedestrian and cycling opportunities. The city further has ambitious plans to greatly traffic-calm the inner four districts of the city, eventually allowing only entrance by residents. This should be in place by 2015.

12. London, England: A congestion charge was instituted for the central areas of London, charging cars entering certain points. This has turned out to be extremely successful, with traffic volume down by 18% and congestion reduced by 30%. At the same time, 59 new bus lanes and 201 bus priority signals introduced. Public transport is being made free of use for children, with the eventual goal of free public transport through the age of 18.

13. Belgium: A government program offers free monthly public transport passes to car owners who turn in their car ownership. In the event that a whole family has given access to private car ownership, transit passes are offered free to all family members.

Appendix C
Guide to Organizations and Resources

This final section of the guide offers a valuable source of information to aid in further research, detailed information on certain subjects, as well as contact information for organizations that provide consulting and advice in key areas. Suggestions for further reading are also given. The opportunities are limitless!
### Hungarian Young Greens

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<tbody>
<tr>
<td><strong>Hungarian Young Greens</strong></td>
<td>Zöld Fiatalok</td>
<td>+36 1 788 8459</td>
<td><a href="mailto:info@zofi.hu">info@zofi.hu</a></td>
<td><a href="http://www.zofi.hu">www.zofi.hu</a></td>
<td>The producer of the Sustainable Mobility Guide. Active in transport related issues as well as in other environmental areas</td>
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<td>Szondi u.54</td>
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<td>1063 Budapest</td>
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### Clean Air Action Group

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<tr>
<td><strong>Clean Air Action Group</strong></td>
<td>Levegô Munkacsoport</td>
<td>+36 1 411-0509</td>
<td><a href="mailto:levego@levego.hu">levego@levego.hu</a></td>
<td><a href="http://www.levego.hu">www.levego.hu</a></td>
<td>One of the oldest Hungarian NGOs specializing in transport issues.</td>
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<td></td>
<td>465 Budapest, Pf. 1676</td>
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### Hungarian Cyclist Federation

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<tr>
<td><strong>Hungarian Cyclist Federation</strong></td>
<td>Magyar Kerékpáros Klub</td>
<td>(+36) 30/964-6016</td>
<td><a href="mailto:info@kerekparosklub.hu">info@kerekparosklub.hu</a></td>
<td><a href="http://www.kerekparosklub.hu">www.kerekparosklub.hu</a></td>
<td>This federation covers bicycle issues on a country-wide level.</td>
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<td>Radnótí Miklós u. 29.</td>
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### Mobility Week, Hungary

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<tr>
<td><strong>Mobility Week, Hungary</strong></td>
<td>Ministry for Economy and Transport</td>
<td>+36 1 4728748</td>
<td><a href="mailto:info@kerekparosklub.hu">info@kerekparosklub.hu</a></td>
<td><a href="http://www.kerekparosklub.hu">www.kerekparosklub.hu</a></td>
<td>The official representative of European Mobility Week</td>
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<td>13-15, Honvéd str</td>
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<td>1055 Budapest</td>
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<td>Mr Imre Mészáros</td>
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<td>Tel: +36 1 4728721</td>
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### Yugo Cycling Campaign

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<tr>
<td><strong>Yugo Cycling Campaign</strong></td>
<td>Decanska 5</td>
<td>+381-11 3225 949</td>
<td><a href="mailto:boricmilan@hotmail.com">boricmilan@hotmail.com</a></td>
<td><a href="http://www.kerekparosklub.hu">www.kerekparosklub.hu</a></td>
<td>Cycling club, member of European Cyclist Federation. National distributor of Sustainable Mobility Guide</td>
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<td>11000 Belgrade</td>
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<td>Serbia &amp; Montenegro</td>
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### Mobility Week, Serbia

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<tr>
<td><strong>Mobility Week, Serbia</strong></td>
<td>Ministry of Transport &amp; Telecommunications</td>
<td>+381 113 617 486</td>
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<td><a href="http://www.kerekparosklub.hu">www.kerekparosklub.hu</a></td>
<td>The official representative of European Mobility Week</td>
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<td>Nemanjina 22-26 - CS-11000 Beograd</td>
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<td>Mr Dusan Mladenovic</td>
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<td>Tel: +381 113 616 426</td>
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<td>Fax: +381 113 617 486</td>
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### Appendix C: Guide to Organizations and Resources

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<th><strong>Organization</strong></th>
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</table>
| **Za Zemiata**   | Environmental Association  
           “Za Zemiata”  
           PO. Box 975  
           Sofia 1000  
           Bulgaria  
           tel./fax: +359 2 943 11 23  
           info@zazemiata.org | One of the most active  
                       Bulgarian environmental  
                       NGOs. National distributor of Sustainable Mobility Guide |
| **Mobility Week, Bulgaria** | Ministry of Environment and Water  
           67, William Gladstone  
           Street - BG-1000 Sofia  
           Ms Nelly Ilieva  
           Tel: +359 29 406 299 | The official representative of European Mobility Week |
| **Bisiklet Sevenler Derneği** | Bisiklet Sevenler Derneği  
           19 Mayıs cd. No: 32 kat:3  
           İstanbul  
           Tel: +90-212-3651 190  
           Fax: +90-212-3651 191  
           murat@bisikletdunyasi.com | Turkish Cyclist federation,  
                       member of the European Cyclist Federation. A national distributor of the Sustainable Mobility Guide |
| **Human Settlements Association** | Insan Yerleşimleri Derneği  
           Nuruziya Sokak 35/1  
           Beyoğlu 80060 İstanbul  
           Turkey  
           Tel: +90 0212 244 71 64  
           insanyerlesimleri@insanyerlesimleri.org | This organization deals with urban issues. A national distributor of the Sustainable Mobility Guide |
| **Turkish Traffic Safety Association** | kevser@msu.edu.tr | An association, based in  
                       Istanbul, related to traffic and transportation. A national distributor of the Sustainable Mobility Guide |
| **ITU-Institute of Social Sciences Architecture Faculty** | ITU-Institute of Social Sciences  
           Architecture Faculty  
           – Taskisla  
           34437-Istanbul  
           Tel:212-2433181  
           peltn@yahoo.com | Also a national distributor of the Sustainable Mobility Guide |
### Appendix C: Guide to Organizations and Resources

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<th>Organization</th>
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<tr>
<td><strong>Mobility Week, Turkey</strong></td>
<td>Ministry of Environment and Forestry&lt;br&gt;İstanbul Caddesi No:98 – ISKITLER/ANKARA&lt;br&gt;Abdurrahman Uluirmak&lt;br&gt;Tel: +90 3123846722</td>
<td>The official representative of European Mobility Week</td>
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<tr>
<td><strong>Academy for Peace and Development</strong></td>
<td>10a, M. Asatiani str., Tbilisi 0177, Georgia&lt;br&gt;Tel./fax: +995 32 39 07 72&lt;br&gt;<a href="mailto:giorgi.kakulia@gmail.com">giorgi.kakulia@gmail.com</a></td>
<td>National distributor of the Sustainable Mobility Guide</td>
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<tr>
<td><strong>Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH</strong></td>
<td>Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation)&lt;br&gt;Division 44 - Environment and Infrastructure Transport and Mobility&lt;br&gt;P.O. Box 5180 65726 Eschborn, Germany&lt;br&gt;<a href="mailto:transport@gtz.de">transport@gtz.de</a></td>
<td>GTZ provides viable, forward-looking solutions for political, economic, ecological and social development in a globalized world. GTZ has produced a large body of technical advice, both accessible via their website and in print form. They operate worldwide.</td>
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<tr>
<td><strong>Victoria Transport Policy Institute</strong></td>
<td>Victoria Transport Policy Institute&lt;br&gt;1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada&lt;br&gt;Phone &amp; Fax: (250)360-1560&lt;br&gt;<a href="mailto:info@vtpi.org">info@vtpi.org</a></td>
<td>The Victoria Transport Policy Institute is an independent research organization dedicated to developing innovative and practical solutions to transportation problems.</td>
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<tr>
<td><strong>Institute for Transportation and Development Policy – ITDP</strong></td>
<td>ITDP&lt;br&gt;127 West 26th Street, Suite 1002&lt;br&gt;New York, NY, 10001&lt;br&gt;Phone: 212-629-8001; Fax: 212-629-8033&lt;br&gt;<a href="mailto:mobility@itdp.org">mobility@itdp.org</a></td>
<td>The Institute for Transportation and Development Policy (ITDP) was founded in 1985 to promote environmentally sustainable and equitable transportation policies and projects worldwide.</td>
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**Georgia**

Worldwide organizations specializing in sustainable mobility issues:

- **Victoria Transport Policy Institute**: Victoria Transport Policy Institute<br>1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada<br>Phone & Fax: (250)360-1560<br>info@vtpi.org

- **Institute for Transportation and Development Policy – ITDP**: ITDP<br>127 West 26th Street, Suite 1002<br>New York, NY, 10001<br>Phone: 212-629-8001; Fax: 212-629-8033<br>mobility@itdp.org

- **Academy for Peace and Development**: 10a, M. Asatiani str., Tbilisi 0177, Georgia<br>Tel./fax: +995 32 39 07 72<br>giorgi.kakulia@gmail.com

- **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH**: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation)<br>Division 44 - Environment and Infrastructure Transport and Mobility<br>P.O. Box 5180 65726 Eschborn, Germany<br>transport@gtz.de

- **Mobility Week, Turkey**: Ministry of Environment and Forestry<br>İstanbul Caddesi No:98 – ISKITLER/ANKARA<br>Abdurrahman Uluirmak<br>Tel: +90 3123846722

- **Academy for Peace and Development**: 10a, M. Asatiani str., Tbilisi 0177, Georgia<br>Tel./fax: +995 32 39 07 72<br>giorgi.kakulia@gmail.com

- **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH**: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation)<br>Division 44 - Environment and Infrastructure Transport and Mobility<br>P.O. Box 5180 65726 Eschborn, Germany<br>transport@gtz.de

- **Victoria Transport Policy Institute**: Victoria Transport Policy Institute<br>1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada<br>Phone & Fax: (250)360-1560<br>info@vtpi.org

- **Institute for Transportation and Development Policy – ITDP**: ITDP<br>127 West 26th Street, Suite 1002<br>New York, NY, 10001<br>Phone: 212-629-8001; Fax: 212-629-8033<br>mobility@itdp.org

- **Academy for Peace and Development**: 10a, M. Asatiani str., Tbilisi 0177, Georgia<br>Tel./fax: +995 32 39 07 72<br>giorgi.kakulia@gmail.com

- **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH**: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation)<br>Division 44 - Environment and Infrastructure Transport and Mobility<br>P.O. Box 5180 65726 Eschborn, Germany<br>transport@gtz.de

- **Victoria Transport Policy Institute**: Victoria Transport Policy Institute<br>1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada<br>Phone & Fax: (250)360-1560<br>info@vtpi.org

- **Institute for Transportation and Development Policy – ITDP**: ITDP<br>127 West 26th Street, Suite 1002<br>New York, NY, 10001<br>Phone: 212-629-8001; Fax: 212-629-8033<br>mobility@itdp.org

- **Academy for Peace and Development**: 10a, M. Asatiani str., Tbilisi 0177, Georgia<br>Tel./fax: +995 32 39 07 72<br>giorgi.kakulia@gmail.com

- **Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH**: Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German Technical Cooperation)<br>Division 44 - Environment and Infrastructure Transport and Mobility<br>P.O. Box 5180 65726 Eschborn, Germany<br>transport@gtz.de

- **Victoria Transport Policy Institute**: Victoria Transport Policy Institute<br>1250 Rudlin Street, Victoria, BC, V8V 3R7, Canada<br>Phone & Fax: (250)360-1560<br>info@vtpi.org

- **Institute for Transportation and Development Policy – ITDP**: ITDP<br>127 West 26th Street, Suite 1002<br>New York, NY, 10001<br>Phone: 212-629-8001; Fax: 212-629-8033<br>mobility@itdp.org
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<tr>
<td><strong>GTZ, Sustainable Urban Transport Project (SUTP-Asia)</strong></td>
<td>GTZ, Sustainable Urban Transport Project (SUTP-Asia) Room 0942, Transport and Tourism Division, UN-ESCAP UN Building Rajadamnern Nok Avenue., Bangkok 10200 Thailand Tel: 66 (0)-2-288 1321/2576 Fax: 66 (0)-2-280 6042 <a href="mailto:sutp@sutp.org">sutp@sutp.org</a> Sustainable transportation advice and resources for policy makers. This is affiliated with GTZ.</td>
</tr>
<tr>
<td><strong>The Centre for Sustainable Transportation</strong></td>
<td>Centre for Sustainable Transportation 103 - 520 Portage Avenue Winnipeg, MB R3C 0G2 Tel: 1-204-982-1140 Fax: 1-204-943-4625 <a href="mailto:cstinfo@uwinnipeg.ca">cstinfo@uwinnipeg.ca</a> The Centre was formed to help overcome the barriers to the attainment of sustainable transportation, in Canada and elsewhere, through the provision of well-reasoned and balanced information and analysis.</td>
</tr>
<tr>
<td><strong>Transportation Alternatives</strong></td>
<td>Transportation Alternatives, 127 West 26th Street, Suite 1002, New York, NY 10001. Phone: +1 212-629-8080 Fax: +1 212-629-8334 <a href="mailto:info@transalt.org">info@transalt.org</a> Encourage bicycling, walking and public transit as alternatives to automobile use, and reduce automobile use and its attendant environmental and social harms.</td>
</tr>
<tr>
<td><strong>SUSTRAN</strong></td>
<td>National Cycle Network Centre 2 Cathedral Square College Green Bristol BS1 5DD Tel. +44 0117 926 8893 Tel: +44 0845 113 00 65 Fax: +44 0117 929 4173 E: <a href="mailto:info@sustrans.org.uk">info@sustrans.org.uk</a> Sustrans is the UK’s leading sustainable transport charity, working on practical projects so people can choose to travel in ways that benefit their health and the environment.</td>
</tr>
</tbody>
</table>
## Appendix C: Guide to Organizations and Resources

### Transport related Organizations and websites

<table>
<thead>
<tr>
<th>Organization/Website</th>
<th>Contact Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International Association of Public Transport</strong>&lt;br&gt;www.uitp.com</td>
<td>Regional and central contact information located on website</td>
<td>Worldwide association of public transportation</td>
</tr>
<tr>
<td><strong>Bus Rapid Transit Central</strong>&lt;br&gt;www.busrapidtransit.net</td>
<td><a href="mailto:jim@busrapidtransit.net">jim@busrapidtransit.net</a></td>
<td>A web portal for Bus Rapid Transit</td>
</tr>
<tr>
<td><strong>Shared Space project</strong>&lt;br&gt;www.shared-space.org</td>
<td>Lead partner: Rob Duvergé&lt;br&gt;P O Box 20120, 8900 HM Leeuwarden, Holland&lt;br&gt;Tel. +31 58 292 53 52&lt;br&gt;Fax. +31 58 292 58 19&lt;br&gt;<a href="mailto:r.f.duverge@fryslan.nl">r.f.duverge@fryslan.nl</a></td>
<td>Shared Space is a concept of traffic based on the removal of traffic signs, and tried and feasible way for different traffic modes to share road space.</td>
</tr>
<tr>
<td><strong>Traffic Calming Guide</strong>&lt;br&gt;www.trafficcalming.org</td>
<td>Informational website only</td>
<td>Traffic calming and neighborhood traffic management</td>
</tr>
</tbody>
</table>

### Resources and Information on Urban and Design Issues

<table>
<thead>
<tr>
<th>Organization/Website</th>
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<tbody>
<tr>
<td><strong>Carfree Cities</strong>&lt;br&gt;www.carfree.com</td>
<td><a href="mailto:mailbox@carfree.com">mailbox@carfree.com</a></td>
<td>A lot of design work has been developed to assist planners and builders of carfree areas and carfree cities. There is both a useful book and also an extensive website to support the ideas. The author is coming forth with his next book, entitled Carfree Design Manual.</td>
</tr>
<tr>
<td><strong>Ecocity Builders</strong>&lt;br&gt;www.ecocitybuilders.org</td>
<td>Ecocity Builders&lt;br&gt;P O Box 697&lt;br&gt;Oakland, CA 94604&lt;br&gt;Phone and Fax: 510-444-4508&lt;br&gt;<a href="mailto:info@ecocitybuilders.org">info@ecocitybuilders.org</a></td>
<td>We are a non-profit organization dedicated to reshaping cities for the long-term health of human and natural systems. Our goals include returning healthy biodiversity to the heart of our cities, agriculture to community gardens and the streets, and convenience and pleasure to walking, bicycling and transit.</td>
</tr>
<tr>
<td><strong>Congress for the New Urbanism</strong>&lt;br&gt;www.cnu.org</td>
<td>The Marquette Building&lt;br&gt;140 S. Dearborn St.&lt;br&gt;Suite 310&lt;br&gt;Chicago, IL 60603, USA&lt;br&gt;Tel: 312-551-7300&lt;br&gt;Fax: 312-346-3323&lt;br&gt;<a href="mailto:cnuinfo@cnu.org">cnuinfo@cnu.org</a></td>
<td>An NGO and focal contact point for disseminating the Principles of New Urbanism. Works with architects, developers, planners and others.</td>
</tr>
</tbody>
</table>
### Ecocity Project
www.ecocityprojects.net

Ecocity@tiscali.nl
Albert Jansen +31 6 2290 7849
Andreas von Zadow +49 3320920833

The Ecocity Quality Support Group has in-depth knowledge and experience with Sustainable Master-planning throughout Europe.

### Creative communities – David Engwicht
www.creative-communities.com
www.lesstraffic.com

David Engwicht
7 Fletcher Pde
Bardon Q 4065
Australia
Tel: +61 7 3366 7746
david@lesstraffic.com

Creative Communities is an Australian source of social innovations, focusing especially on increasing the quality of neighborhoods. Individuals, communities and decision-makers are offered quality advice on how to use their creative genius.

### World Carfree Network
www.worldcarfree.net

World Carfree Network
International Coordination Centre, Krátká 26
100 00 Prague 10
Czech Republic
tel/fax: (420) 274-810-849
info@worldcarfree.net

This is a worldwide network of organizations that are working towards carfree solutions to existing city problems. The network organizes a yearly conference entitled “Toward Carfree Cities” and publishes an informative magazine called Carbusters.

### Healthy Cities Network
www.who.dk/healthy-cities

World Health Organization – Healthy Cities
Scherfigsvej 8
DK-2100 Copenhagen Ø
Denmark
Fax: +45 39 17 18 60
infowhohcp@euro.who.int

A World Health Organization network of cities, emphasizing health in planning and urban development.

### European Mobility Week
www.mobilityweek-europe.org

European Info Point: Eurocities
Ms Valérie Bénard
Tel: +32 2 552 08 66
Fax: +32 2 552 08 89

This is a Europe-wide initiative to create a special week of events related to sustainable mobility. It takes place every year in the week of World Carfree day, on September 21. Every year, more and more communities throughout Europe join this initiative, creating special events and highlighting the need for sustainability. In 2005, 221111 communities took part.

### Velomondial
www.velomondial.net

Executive Director Operations:
+31 (0)20 627 0675 phone,
+31 (0)62 705 5688 mobile,
operations@velomondial.net

Velo Mondial works on the international level to support cycling planning on the agenda of local and national governments. Velo Mondial also holds annual conferences dedicated to cycling issues.
### Appendix C: Guide to Organizations and Resources

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<tr>
<td><strong>Slow Cities Network</strong>&lt;br&gt;www.cittaslow.net/world</td>
<td>Contact possible through website</td>
<td>The Slow Cities movement is an offshoot of the Slow Food movement, which has concentrated on food and wine. Slow Cities takes this further to include environmental conservation, the promotion of sustainable development, and the improvement of the urban life.</td>
</tr>
<tr>
<td><strong>European Cyclist Federation</strong>&lt;br&gt;www.ecf.com</td>
<td>c/o ADFC&lt;br&gt;Grünenstrasse 120&lt;br&gt;28199 Bremen, Germany&lt;br&gt;Tel: +49 421 346 29 39&lt;br&gt;Fax: +49 421 346 29 50&lt;br&gt;<a href="mailto:office@ecf.com">office@ecf.com</a></td>
<td>A portal for European cyclist associations</td>
</tr>
<tr>
<td><strong>Earth Day Network</strong>&lt;br&gt;www.earthday.net</td>
<td>Earth Day Network&lt;br&gt;Washington, D.C., USA&lt;br&gt;1616 P Street NW, Suite 340&lt;br&gt;Washington, D.C. 20036 USA&lt;br&gt;Tel: +1 202.518.0044&lt;br&gt;Fax: +1 202.518.8794</td>
<td>Worldwide environmental awareness, with large international network</td>
</tr>
<tr>
<td><strong>Sustainable Cities</strong>&lt;br&gt;www.sustainable-cities.org.uk</td>
<td>6 North Street East&lt;br&gt;Newcastle Upon Tyne&lt;br&gt;NE1 8ST&lt;br&gt;England&lt;br&gt;Tel: +44 (0) 191 227 3500&lt;br&gt;Fax: +44 (0) 191 227 3066</td>
<td>An institute, based in the UK, which helps to develop and promote sustainable approaches to urban living.</td>
</tr>
<tr>
<td><strong>Local Government Commission</strong>&lt;br&gt;www.lgc.org</td>
<td>1414 K St, Ste 600&lt;br&gt;Sacramento, CA 95814&lt;br&gt;Tel: +1(916) 448-1198&lt;br&gt;Fax: +1(916) 448-8246&lt;br&gt;<a href="mailto:info@lgc.org">info@lgc.org</a></td>
<td>Contains a wealth of information and technical assistance to local governments wishing to create more sustainable communities</td>
</tr>
<tr>
<td><strong>Sustainable Communities</strong>&lt;br&gt;www.sustainable.org</td>
<td><a href="mailto:concern@concern.org">concern@concern.org</a></td>
<td>A large body of information on sustainable community building</td>
</tr>
<tr>
<td><strong>Walkable communities</strong>&lt;br&gt;www.walkable.org</td>
<td>33 E. Pine Street&lt;br&gt;Orlando, FL 32801&lt;br&gt;USA&lt;br&gt;Tel: +1-866-347-2734&lt;br&gt;Fax: +1-407-839-1789</td>
<td>Promotes the concept of walkable communities</td>
</tr>
</tbody>
</table>
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<tr>
<th><strong>Child Friendly Cities</strong></th>
<th><a href="http://www.childfriendlycities.org">www.childfriendlycities.org</a></th>
<th>International Secretariat for Child Friendly Cities, UNICEF Innocenti Research Centre Piazza SS. Annunziata, 12 50122 Florence, Italy Tel.: +39 05520330 Fax: +39 0552033220 <a href="mailto:florencecfcsen@unicef.org">florencecfcsen@unicef.org</a></th>
<th>A local system of good governance, dedicated to protecting children’s rights in the city environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Peace</strong></td>
<td><a href="http://www.roadpeace.org">www.roadpeace.org</a></td>
<td>PO Box 2579, London NW10 3PW, United Kingdom Tel: +44 (0)20 8838 5102 Fax: +44 (0)20 8838 5103 <a href="mailto:info@roadpeace.org">info@roadpeace.org</a></td>
<td>Draws attention to victims of road traffic. Publishes information about traffic accidents.</td>
</tr>
<tr>
<td><strong>Decroissance</strong></td>
<td><a href="http://www.decroissance.org">www.decroissance.org</a>, <a href="http://www.decroissance.info">www.decroissance.info</a></td>
<td>41, rue des Martyrs de Vingré 42000 Saint Etienne FRANCE + 33 (0) 4 77 41 18 16 <a href="mailto:contact@decroissance.org">contact@decroissance.org</a></td>
<td>A movement in of itself, Decroissance preaches the virtues of slowing down. Contains a lot of information, mostly in French.</td>
</tr>
<tr>
<td><strong>UN Carfree Days</strong></td>
<td><a href="http://www.uncfd.org">www.uncfd.org</a></td>
<td>Kathleen Abdalla Energy and Transport Branch, Division for Sustainable Development Department for Economic and Social Affairs (DESA) United Nations, DC2-2018, New York, NY 10017 USA Phone: +212-963 8416, Fax: +1 212 963-4340 Email: <a href="mailto:abdallak@un.org">abdallak@un.org</a></td>
<td>A UN site with background information and information regarding participation in Carfree days</td>
</tr>
<tr>
<td><strong>IPPUC</strong></td>
<td><a href="http://www.ippuc.org.br">www.ippuc.org.br</a></td>
<td>Rua bom Jesus 699 80035-010 Curitiba, Brazil +55 41 3250 1414 <a href="mailto:ippuc@ippuc.org.br">ippuc@ippuc.org.br</a></td>
<td>City planning authority of Curitiba, contains lots of information about the success story of this city</td>
</tr>
<tr>
<td><strong>Rising Tide UK</strong></td>
<td><a href="http://risingtide.org.uk">http://risingtide.org.uk</a></td>
<td>62 Fieldgate Street London E1 1ES Tel: 07708 794665 <a href="mailto:info@risingtide.org.uk">info@risingtide.org.uk</a></td>
<td>The focus of this group is on climate change.</td>
</tr>
<tr>
<td><strong>Cultura for a New Mobility</strong></td>
<td><a href="http://www.mobility-cultura.net">www.mobility-cultura.net</a></td>
<td>Informational website only</td>
<td>Contains an extensive list on best practices in mobility management and urban planning</td>
</tr>
<tr>
<td><strong>Carfree areas</strong></td>
<td><a href="http://en.wikipedia.org/wiki/List_of_car-free_areas">http://en.wikipedia.org/wiki/List_of_car-free_areas</a></td>
<td>Provided by wikipedia.org</td>
<td>An near-extensive list of carfree areas around the world</td>
</tr>
</tbody>
</table>

**Other useful sources of information**

- Carfree areas
- Road Peace
  - www.roadpeace.org
- Decroissance
- UN Carfree Days
  - www.uncfd.org
- IPPUC
  - www.ippuc.org.br
- Rising Tide UK
  - http://risingtide.org.uk
- Cultura for a New Mobility
  - www.mobility-cultura.net
- Child Friendly Cities
  - www.childfriendlycities.org
## Relevant print sources

1. Sustainable Transport: A Sourcebook for Policymakers in Developing Cities, GTZ
   An excellent collection of transport related publications, with modules on various issues, such as Mobility Management, Bus Rapid Transit, Urban Road Safety, Private Sector Participation in Transport Infrastructure, Carfree Development, just to name a few. Available via the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH: [http://www2.gtz.de/publikationen/thissearch/publikationen/Search.aspx?Topic=Transport&language=de](http://www2.gtz.de/publikationen/thissearch/publikationen/Search.aspx?Topic=Transport&language=de)


3. David Engwicht, Mental Speed Bumps, Creative Commons International, [www.mentalspeedbumps.com](http://www.mentalspeedbumps.com)


5. Reclaiming city streets for people: Chaos or quality of life?, European Commission, Directorate-General of the Environment. The whole publication is available via the internet, at [http://publications.eu.int/](http://publications.eu.int/) or [env-pubs@cec.eu.int](mailto:env-pubs@cec.eu.int). It is also available in print format.


## Bibliography

1. Ivan Illich, Energy and Equity, Perennial Library, 1974
2. Wolfgang Zuckerman, End of the Road, Chelsea Green Publishing Co., 1991
3. Kate Evans, Funny weather comic, Rising Tide, 2000
4. D
10. Enrique Pólya, Developing Cities, GTZ, 2002
11. ToD
12. Lloyd Wright, GTZ, 2002
13. LD

50
**Bollard** – a strong post on the side of a street, intended to protect users of the sidewalk or a bike lane from encroachment by other forms of transportation.

**Bottleneck** – a narrowing of the street width, usually at the entrance to a neighborhood. A mechanism to slow traffic.

**Congestion Charge** – a fee that is applied to motorized traffic entering the city center. Intended to reduce city-center traffic.

**Counterflow** – the movement of certain modes of traffic, such as bus or bicycle, in the opposite direction of the main traffic flow, usually in specially marked lanes.

**Dwell time** – the time that buses or trams are required to wait in traffic, at points other than at passenger stops.

**Feeder route** – a bus (usually) route that serves the specific goal of bringing passengers to main or express routes.

**Greenhouse effect** – when the sun shines, the radioactive gases (principally water vapor and carbon dioxide) that trap the sun’s heat and prevent it from returning back to space. Excessive amounts of pollution cause this natural process to have undesirable and dangerous effects, such as global warming.

**Greenways** – a corridor of land, usually between urban areas, containing natural elements (such as forests or water), that serve as recreational use or for non-motorized transport.

**Grid Scale** – urban layout patterns, where housing blocks are marked by right angle street patterns, adding up to a system of horizontal and vertical lines.

**Intermodality** – the combination of different types of transport used in one particular trip.

**Mixed use** – a designation for neighborhoods, where different types of functions are present, such as residential buildings, public buildings, workplaces and recreational areas.

**Modal shift** – over a period of time, the change in transport behavior of a certain population.

**Modal split** – the division in the use of different modes of transport of a given population.

**Peak Oil** – the concept of the point in time when the oil resources of a particular region (or the globe as a whole) have reached the half-way mark of extraction.

**Personal motorized transport** – any mode of transportation that is propelled by a motor and serves only a small number of passengers. Typically an automobile or motorcycle.

**Severance** – the dividing effect on a community by a busy thoroughfare, which makes it difficult or impossible to travel to adjacent areas.

**Tempo 30 Zone** – a traffic-calmed neighborhood where regulations forbid vehicles to travel at speeds above 30 kph.

**Travel evaporation** – the studied effect of the overall volume of traffic that disappears over a given time when certain streets or districts have been shut off to automobile traffic.

**Travel induction** – the studied effect of the overall volume of traffic increasing upon the building of new roads or the widening of existing ones.

**User design** – the practice of incorporating future tenants of a new building development into the design process and taking part in making key decisions about the planned development.
“How to turn your town into a pleasanter, calmer, more easily navigable, and fun place to live”