

# ***STOP GLOBAL WARMING BY TRUE INNOVATIONS***

*[www.acabion.com](http://www.acabion.com)*



***How to Show Responsibility  
For Generations to Come...***





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## ***Acknowledgment and first explanation***

Acabion is a project by MIKOVA Systems, a most dynamic organization obliged to (r)evolutionary global improvements achieved by true innovations. MIKOVA Systems is based in Lucerne, New York and Zagreb and is run by Lenka Mikova, one of the brightest and at the same time most responsible strategy consultants I ever knew. Without her support and expertise the project would not exist. My most cordial thanks to Lenka Mikova, as well as to all our marvelous Acabion team and – most important – to anyone who is listening to our thoughts. Thank you all.

Lucerne, November 9<sup>th</sup> 2007

Dr.-Ing. Peter Maskus, Acabion

P.S.: The name "Acabion" is a combination of „Acadia“ and „Bionics“: Acadia, a marvelous national park at Maine's Atlantic coast, is famous for its quite untouched, beautiful nature as well as for its mystic rocky shoreline. This allegory in both of its aspects is momentous for our mission: On the one side, we feel deeply connected to biotopes, widely untouched by mankind, and on the other side – in our role as professional innovators – we feel like the water, rolling against those hard rocks (of old fashioned habits), but changing the coastlines anyhow.

Bionics, as „Acabion's“ completing syllable, shapes our innovations as deeply as we are able to perceive and permute bionic principles in any way possible.





***"When great changes occur in history, when great principles are involved, as a rule the majority are wrong."***

***Eugene V. Debs***





*This is a funding proposal. It is a preparation stage of a business plan and a rough layout of the project. At the same time it is a “global open letter” about the future of mobility of all mankind. We are convinced that “swarm intelligent” behavior of humanity needs open communication. So please take this file as our first step towards a funding, and at the same time do not hesitate to send it to colleagues, friends, relatives and to anyone else. Everyone should get this information. Thank you.*



*Lucerne, November 9<sup>th</sup> 2007*

*The Acabion Team*





***“Ideas won't go to jail. In the long run of history,  
the censor and the inquisitor have always lost.”***

**A. Whitney Griswold**





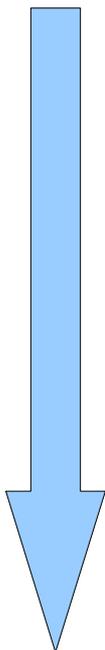
# VISUALIZING THE VISION

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A new world of pure electric individual mobility

## Time-line



1800 train

## Energy source

coal, later diesel and non-solar electricity

1900 cars and airplanes

gasoline, diesel, kerosene, some cars electric

200X road streamliner

electricity, as much as possible solar generated

2100 new high-speed tracks

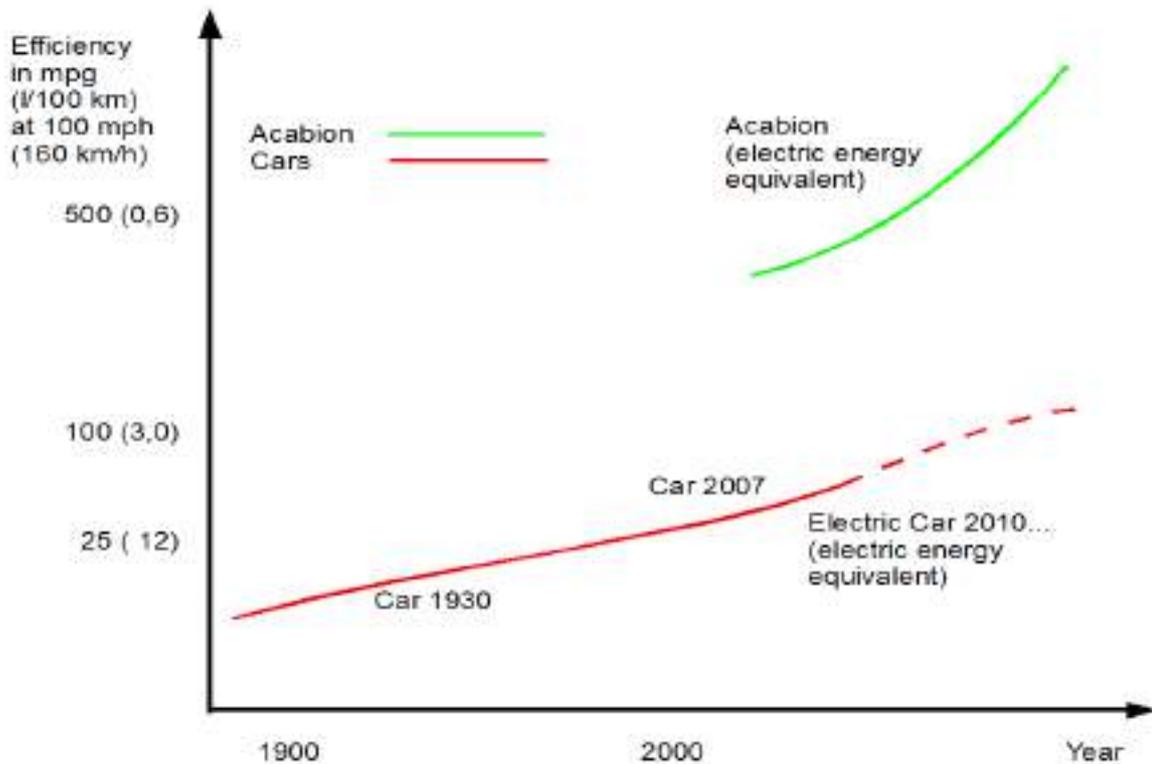
pure solar electricity





# VISUALIZING THE VISION

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A new world of efficiency



Road-Streamliner of the 21<sup>st</sup> Century. The successor of “the car”.

Effectiveness in technology is achieved by applied bionics. Hybrid engines increase efficiency of cars by 25%. Solar electric drives increase efficiency of cars by 100%. We increase efficiency of mobility by 1000% to 2500%. How? By just forgetting about “cars”. Road streamliners, as automatically balanced two-wheel “bionic rockets” will be the new category and the new fascination. And cars will go where they belong: To the museum (if they are lucky).





## VISUALIZING THE VISION

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“Murata Boy” by [www.murata.com](http://www.murata.com). A toy robot showing how future works

If someone can not imagine, how a two-wheel craft can be balanced automatically, have a look at these links or search for “murata boy” in youtube:

<http://www.youtube.com/watch?v=Srwk-i5aXRQ>

[http://www.youtube.com/watch?v=IEZ\\_dKzAThM](http://www.youtube.com/watch?v=IEZ_dKzAThM)

<http://www.youtube.com/watch?v=I99Veja8AvM>

<http://www.youtube.com/watch?v=8Tdm3lp8xN4>

And just for fun this one:

<http://www.youtube.com/watch?v=HBIW7As0nxM>

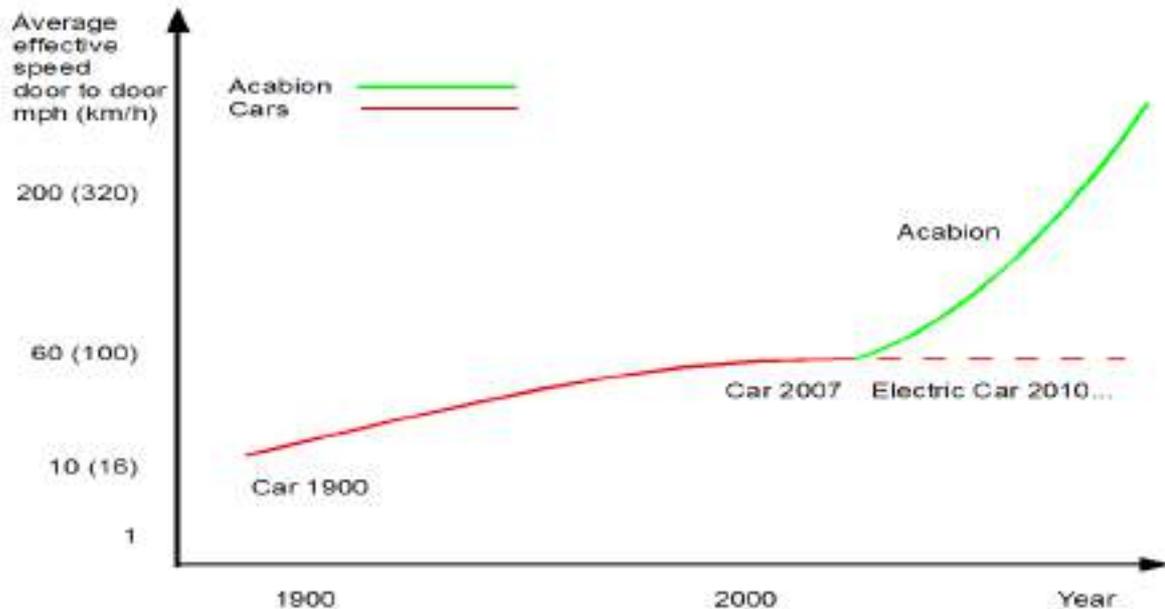
The Acabion balance system will be much more sophisticated. It will be multiple redundant and much more sturdy than a “toy robot”. Anyhow Murata provides the fantasy needed to imagine, that it will work. Four wheel cars are relicts of the horse-drawn carriage era, and hence 1000% to 2500% too ineffective in their key task: Transporting people, and not tons of waste and futile air turbulences. Cargo transport will be mostly on four or more wheels. Passenger transport will be mostly on two.





# VISUALIZING THE VISION

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A new world of speed

Road streamliners will use all roads we have today. On any city street, country-road or highway they will save 90% fuel or other energy forms compared to cars. Why? Because – by adapting to bionic high-tech – they avoid air turbulences and other major losses.



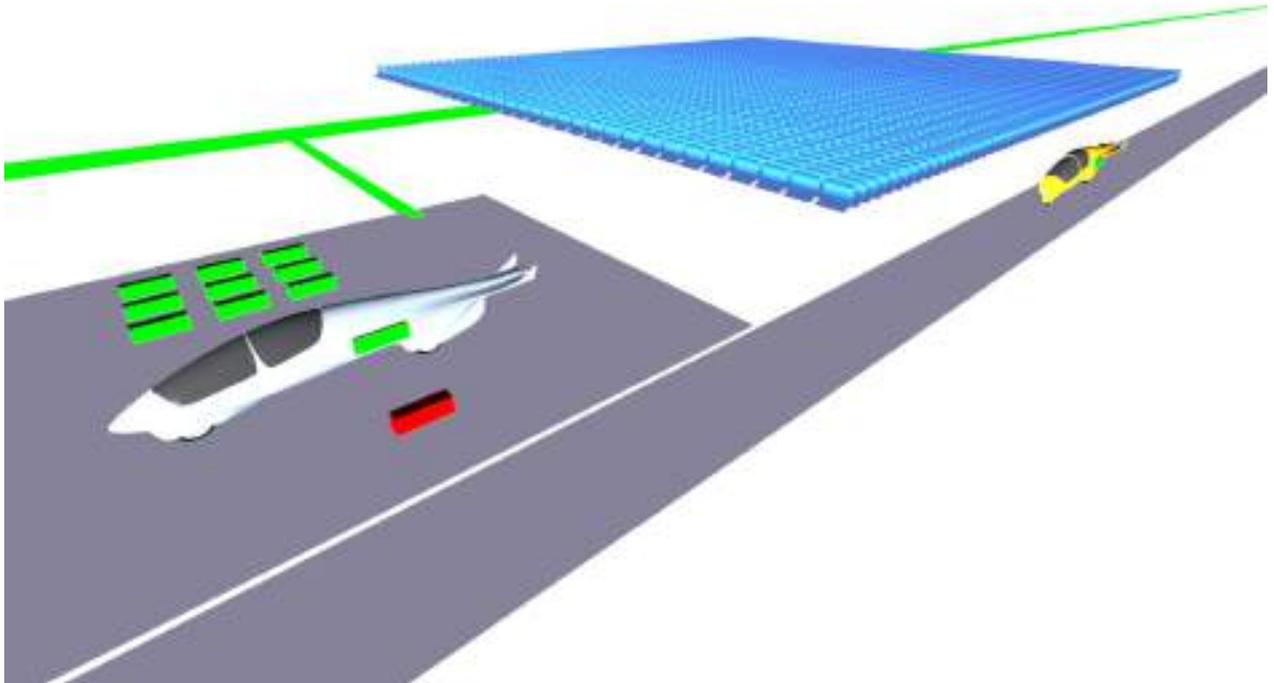
In some decades, on new cost- and speed-effective tracks, additionally to saving resources the speed of traveling will dramatically increase. 400 mph will be the standard speed on automated and elevated tracks in 2100.





# VISUALIZING THE VISION

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## The “big picture in the year 2020”

2020 shows a decentralized solar power plant (blue) and an electric power line (green). The power plant can be very far from the track. Solar electricity will be generated where the most and most intense sunshine is available.

The super efficient electric road streamliners stop at a refill station. An empty battery goes out (red box), a full one goes in (green box), payment for the charge and “here we go”.

The empty battery will be charged again and will wait for the next customer. Due to the super efficient crafts, one battery with a technical status quo of 2007, like the ZEBRA battery type or a lithium polymer will provide 600 miles range at a speed of 100 mph with two passengers on board.

There will be four-wheel streamliners with up to 9 seats as well, but they will be A) very different to today's cars, too and B) they will just cover the smaller part of all individual traffic mileage.

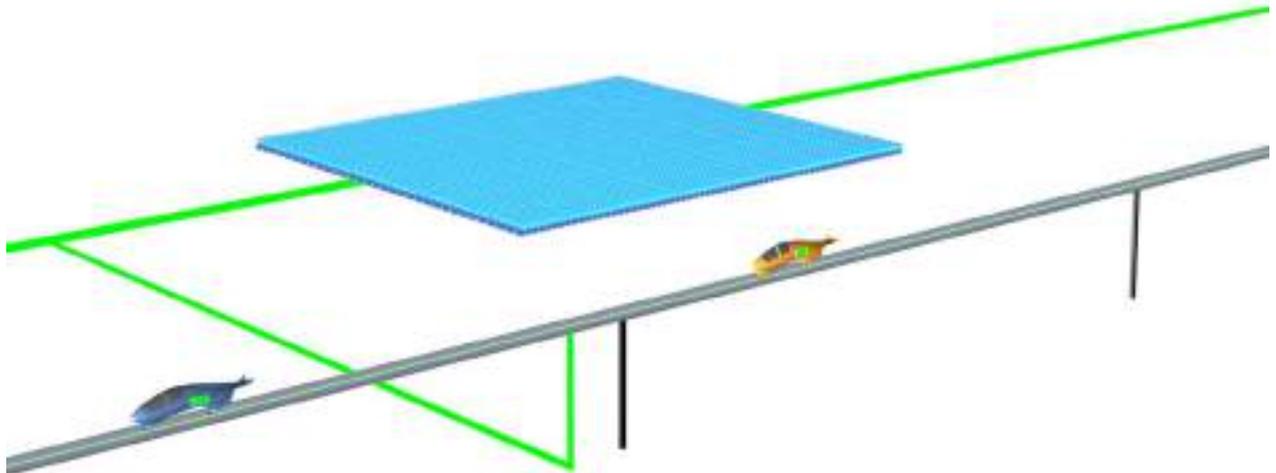
As soon as batteries get better (more capacity, faster to be charged etc.) the battery modules change. Nothing else does. As soon as recharge is fast enough, the battery stays in the craft.





# VISUALIZING THE VISION

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The situation in the year 2100

2100 shows a decentralized solar power plant (blue) and an electric power line (green). The super efficient electric road streamliners mostly drive on the elevated high speed track and do not stop at any refill station any more. The electric energy is delivered from the track to the crafts. The electric transfer principle can be e.g. inductive without mechanical contact.

Due to the permanent power supply the operating range of the electric crafts is unlimited. Anyhow they carry a little battery, permanently hold at 100% charge while on the track. The battery will cover e.g. urban low speed operations whenever the craft is not on the track.





## VISUALIZING THE VISION

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The solar electric powered high speed network in 2100, track examples

With the new streamliner traffic systems, to cover road distances will get ten times cheaper per mile. The crafts are lightweight high tech. They really lost all “designer-fat”. Hence the tracks can be lightweight and cost-efficient, too. As a result, in 2100 there will be fully automated high speed tracks around the world. New “silk roads” will be there, or a dead-straight track from Namibia through the Middle East up to Eastern Siberia, and even a tunnel-track-combination France - England - Scotland - Faroe - Iceland - Greenland - Canada - USA can and hence will be built by generations to come. (The fig. shown is based on Google earth).

National distances will be covered on high-speed tracks, too, like depicted for the region “Paris” in the picture above (the little “star” in the upper left).





***Acabion. The environmental friendly traffic innovation for the 21<sup>st</sup> Century.  
EVEN THE GREATEST CHANGES START WITH SOME FIRST STEPS.  
We are based in Lucerne, New York and Zagreb and at home all around the world.***





***"If you think about luck and happiness for all people, then take action about the preconditions."***

**Lenka Mikova, Acabion C.E.O.**





## One Page Abstract

This proposal is about innovative high-speed-vehicles and -tracks of such effectiveness, that they will change the power supply of worldwide individual mobility to solar electricity.

In the background of this “technical approach”, our Acabion dream and vision is simple: Stop global warming and provide good living conditions and a good infrastructure for each single soul on this planet. Like nice flats, schools, hospitals, solar power plants, workplaces and recreational areas. To achieve it, we are convinced a brandnew global traffic system has to be established. Why? Because A) the traffic systems we have now are a part of the global warming problem and B) they do not provide mobility to the whole world anyhow. E.g. Africa most likely won't ever have a highway network. But like all other continents it can have an outstanding new, fast and solar electric driven individual traffic system instead, new tracks included, that are cheap, but anyhow marvelous in their bionic appearance and all their amazing potentials.

And here we've come full circle: High performance traffic systems are nothing less than capable preconditions for infrastructural improvements: A new world of new and enhanced mobility for everybody and everything will generate more useful infrastructure than most programs ever did before. Hence it will support economical independence, personal satisfaction, political stability and peace. Vehicles and traffic systems are no self purpose. What counts is what they can do for people AND for nature. And the more they can do in this sense, the more acceptable and the more fascinating they are.

The Acabion traffic system depicted in this proposal is the technology carrier for that new mobility concept for all continents. Acabion vehicles are capable to use both all existing roads and new, extremely cheap, but anyhow marvelous innovative future high-speed-tracks, like e.g. Africa, and all other continents as well, will have them.

As will be clearly elaborated in this paper, out of 10 gallons of fuel an average car burns at least 9 completely useless: Too big frontal surface make useless air displacement, too cornered forms make useless turbulences and too big mass make losses in both rolling and accelerating. Due to physics these losses superimpose to unbelievable 95% waste and more. We just do not notice it, because all cars are like that. All of them are disastrously inefficient, what is no good excuse towards future generations.

Just a “new electric engine” in a more or less “traditional car” will not help. As a consequence this proposal is about leaving carriage-based, totally inefficient cars behind and invent the bionic high-tech and new-tech successor of cars. Well, it is already invented. And it is 1000 % to 2500 % more effective than cars. And there is much more: Pure electric traffic of the future, high speeds and immense security on new, sophisticated and anyhow very cost effective tracks. It is a whole, fascinating, tempting new world. Please help us to build it up and write history with us. History of 21<sup>st</sup> century global traffic. This way you can help to stop global warming, to offer clean and anyhow fascinating mobility for generations to come and to establish preconditions for worldwide improvements especially for those, who need it most.





**"Who does not want to change will lose what he wanted to keep."**

**Gustav Heinemann**





# Nine Pages Summary

## Basics

Leonardo da Vinci once said: *"Simplicity is the ultimate sophistication"*. So here comes a simple but sophisticated fact: It has physical reasons that a lot of things – and most life forms – look like they do. Birds look like birds because they adapted to physics of flying. Dolphins looks like dolphins because they adapted to physics of swimming. They adapted, because they always had to and always will have to be efficient. There would be no survival otherwise.

Question: How did human mass mobility look like up to now, and how will it look like in the future? And how is it about "adaption to physical matters"?

Well, the history of mobility is easily narrated: Ships and carts were around since thousands of years. 1800 came with the railroads and 1900 came with cars and airplanes. Now the 21st century is here. And by global warming and other threats like plundered resources of the entire planet it proves, that the past two centuries did not take it serious with adapting technologies to nature. It just did not focus on efficiency. It focused an "moving". As long as it just "moved" we were fine with it. And as long as there were few crafts "that moved more than the others" even the ambitious ones among us were satisfied. But it was never effective. It never adapted to natures needs and to physical matters. at least not in a way bionics always had to do it.

The 21<sup>st</sup> Century traffic will not have too many options. It will have to come up with a fundamental innovation towards environmental friendly mobility, adapted to nature, just like "a live-form".

How will the future of individual, earthbound traffic look like? Will it look like a pickup truck, huge and heavy? Or like an SUV, big and impressive? Will it look like a limousine, still 20 times as heavy as the one human being that in most cases is its sole passenger? Will it look like a bicycle, man powered again? Or like a rickshaw? Well, may be not. Distances we have to and we want to travel are big, so we need too much speed to handle that with manpower.

Or will it look "bionic"? Beautiful, new, surprisingly elegant, "stretched out in the winds of change"? Adapting to nature, instead of offending and plundering it? Even though almost no one knows today, how the longterm future of earthbound global traffic will look like, it anyhow is already defined. It will look very different to what we are used to today. Beautiful, surprisingly elegant, "stretched out in the winds of change" and adapted to nature, instead of offending and plundering it.

And it will be extremely capable, offering 400 mph on elevated tracks, powered by solar electricity, fully automated and extremely safe. The proposal will show it, and it will elaborate on why it is already defined.

The traffic system depicted in this proposal was privately initiated and privately financed over 20 years. Dr. Peter Maskus as the initiator worked internationally as an engineer for railroad-, shipbuilding-, aeronautic- and automotive industry, e.g. at Porsche, BMW and Mercedes-Benz. The Asian culture of Zen and Kaizen plus high rank contacts



to to bionic experts forced him to look at traffic systems in a holistic view and to improve it dramatically in terms of effectiveness and speed.

It sure will be a true innovation and a true bionic, hightech design. And it will look like this:



Fig. 1: Acabion road streamliner.  
The high-speed and long-distance shape of the 21<sup>st</sup> Century traffic

It will be a two-wheel concept, balancing automatically. It is like in bionics: The higher developed, the less "legs". Just for a sturdy parking position kind of a "landing gear" will come down. If one likes it or not is not so much the question any more, as soon as the facts are on the table: 150 km/h (93 mph) with 4 KW at 0.9 l/100km (254 mpg). Or 250 km/h (155 mph) with 11 KW at 1.8 l/100km (132 mpg). These are the facts our grandchildren will be used to. And they will look back at us and wonder, what everything we did wrong.

## **Interview given for the third European Futurist Conference 2007 in Lucerne, Switzerland**

Questions to the Acabion traffic system inventor Dr.-Ing. Peter Maskus, asked by Marc Bodmer

*Marc: The Acabion GTBO is quite something. How did you come up with this revolutionary concept?*

*Peter: The "mental preparation" took me 26 years of being a 100% automotive enthusiast. And the "breakthrough" came, when I had tested each and every Porsche turbo after 4 years of being a Porsche engineer myself in Stuttgart Zuffenhausen: I asked myself: "And what now? Will this be it for the next 120 years?" And I literally "saw" that the*



*answer is "definitely no": I want our grandchildren to go much faster, much more secure and above all much more efficient. I want 400 mph speed for everybody, and not 200 mph for a little, exclusive circle, and I want to have it solar powered.*

Marc: *What inspired you?*

Peter: *Watching seals along the Oregon pacific coast or seagulls gliding over wild ocean waves in a storm. That inspires me. If it is possible to "yawn pitiful", well, than a "super sports car" gives me a "pitiful yawning". An admiral butterfly in the gentle wind, crossing the Alps without breaking a single blossom, that is mere fascination. Bionics inspires me, and passion does. Passion for the future, to make it bright for a mobile and peaceful humanity. To make the future bright we have to be bright. It is simple.*

Marc: *You quote Harriet Tubman saying "Every great dream begins with a dreamer". Are you a dreamer?*

Peter: *Back in 19th Century, Harriet Tubmann was fighting against slavery all her life, and I guess she knew, what a hard time especially "the dreamers" can have. I think she was precisely right saying "it BEGINS with a dreamer" and all I know is that I sure was a big dreamer when I was 3 to 9 years old. Today I must say: Yes and no. "Yes. I am a dreamer" in terms of the future. I dream about an elevated 400 mph "high-speed silk road" or about going to Lake Baikal - solar electric and for a weekend. I dream about traffic networks non interfering biotopes and I dream about global warming getting stopped. "No, I am no dreamer" in terms of two things: A) As to my own "future dream" I know it is no dream, and it can and it will be done. All technologies to do it are there already and the longing for it will come, and it will be very, very powerful. And B) talking about today's car industry, sometimes I think I am the only one who is awake, and they are all crowded in the wrong old cinema, sleeping deep and dreamless in the heat of the global warming, covered with tons of money. If they have all the connections? Well, I don't mind, because we have the concepts, and we will shake them up a bit in their old and wrong movie. Anyhow, I still have my "6 years old dreamer phases", and I have them a lot. And then I really dream. I dream about a mankind in peace that was achieved by worldwide and free mobility and by worldwide amicable encounters from early childhood onwards. THIS is still a dream, and I know it. But the global traffic system is a precondition and it is my way "not to dream my life, but to live my dream".*

Marc: *Dreaming is one thing, but unfortunately one also has to live. How is Acabion financed?*

Peter: *Privately. 100% privately. But – after 20 years of walking that path alone - we look for partners and funding now.*



Marc: *Who supports your extensive research?*

Peter: *Between 1986 and 2000 no one did. If I could have sold obstacles, I would have been a Billionaire then. Since 2001 Lenka Mikova and her strategic consultancy MIKO-VA Systems supports the project. She is Acabion CEO since 2003 and makes sure I can fully concentrate on technology and innovation matters. Since 2004 we see Switzerland as supporting us: We found our new home and a marvelous place for innovations at the D4 Business Center in Lucerne. Here we get best support and best conditions for true innovators. And hence Lucerne is our headquarter.*

Marc: *You criticize the current development of cars, which still is based on carriages of the 19th century. What is so wrong about that?*

Peter: *Well, carriages were beautiful. But there were never as many of them as we have cars today. And they did not burn up global resources. They were made for travel at low speeds. Cars as our "modern carriages" have huge engines now, with hundreds of "horsepowers". But lets us talk in facts here: With a car we go Lucerne-Hamburg and back in 16 hours and doing so we burn a bathtub of fuel (150 l / 40 gallons) for an average of 1.1 passengers. And we get home tired, if we get home at all. From this burned 150 liters, 1 liter was used for the passenger, and 149 liters for this "impressive 1.5 ton car". This is a fact. And if we take an "SUV" we can burn even two bathtubs, again for 1 liter of effective human mobility. THIS is so wrong about it: We burn "bathtubs of fuel" for getting almost "nothing of mobility", compared to that frightening fire. Mass-enthusiasm must not mean, that it is enthusiasm about the right thing. That was a fact throughout history and it is a fact today: Cars are heavy and inefficient in such an insane way, that it exactly compares to a "refrigerator without any insulation". But the "refrigerator industry" is powerful and has even psychologists and PR professionals on its huge payroll to make us all believe, these "refrigerators" are just fine. And since no fridge-maker at all offers an insulated fridge, we can not compare, and so we believe it. We believe it since 120 years. It is a true disaster! Mankind leads wars to get energy to uselessly "burn it in the bathtub" for their non-insulated fridges. It is totally insane.*

Marc: *Is building hybrid-engines and more fuel efficient motors the way of the future?*

Peter: *A "hybrid drive non-insulated fridge" makes as little sense as a "hydrogene fuel cell airplane with a parachute permanently fixed at its tail". Insulation makes sense, and building "airplanes without parachutes" does. And if we insulated the fridge, we will find out that it is so unbelievably efficient now, that we can operate it on pure solar electricity. The electric Acabion will be as beautiful as the best of all historic Bugatti's ever were, and it will give a revival to what Ettore Bugatti himself had in mind: Ultimately sophisticated solutions by concentrating on what is needed and on what is effective. Hence the Acabion E will go 420 km/h at a power setting of 46 KW or 250 km/h at a power setting of 9 KW. This is almost unbelievable. But it is anyhow true. It is physics! THIS happens when "insulating a fridge" and "removing the airplanes parachutes".*



Marc: *How important is Bionics for your work?*

Peter: *To make bionics really work, we defined own principles of applied bionics here at Acabion research center. It took us ten years, but now we can really use it and apply it into well understood and consequent bionic high tech. With getting to know and to structure bionics, we turned engineering upside down, and after we did that, we found, that we actually had turned it downside up... ;-)*

Marc: *The current price tag of the Acabion GTBO is at 1,83 Million €, construction time three years. What will take to get to the next, more efficient level?*

Peter: *The GTBO is worth every cent of that, because it is built according to formula 1 and fighter jet material- and production-settings, swiss quality standards and technologies like even telemetric systems or a carbon fiber monocoque. And it will be the fastest road-legal craft ever. Without governor limit it could race all the way up to 800 km/h. To make it come true we invested 35 Million € private money, direct and indirect costs, plus 20 years of hard and consequent work. This was the effort it took to bring up the 750 hp 550 km/h GTBO as our fourth generation craft of high-speed long-distance 21st Century traffic. The GTBO is the new guiding star making all our children - and ourselves - stop dreaming about the wrong idols like sports cars or formula 1 racers. If you want to see the fastest anachronisms the world ever saw? Go see a formula 1 race!*

*As to achieve new mass mobility, we completed a proposal these days, making contacts on states presidents and VIP level around the world. We will right now start a worldwide process, to push the development and the coming up of electric streamliners forward. Ultra efficient crafts, that learn from the 750 hp GTBO and bring up a "second species", mass production tools included. We will launch that project in the country that provides the best innovation-conditions. The Acabion brand and the GTBO will stay in Lucerne anyhow. But the electric mass production might grow up somewhere else. We will see.*

Marc: *Your vision of a mobile future only begins with the Acabion. You propose an international high-line net for high-speed commuting. What can you tell us about that?*

Peter: *If cars root in carriages since 120 years, roads root are the really sad act: They originate almost 1:1 in the Via Appia, 2300 years ago. No wonder there is a need of new tracks. Worldwide, lean, dead straight, elevated at 20 feet, super fast, cost- and mobility-effective, fully automated, extremely secure and thrilling in their potentials: Lucerne Hamburg will be 90 minutes in 2020, and may be less than 50 in the year 2200. And who wants to build the silk-road as a standard highway or as a TGV-track? It is just not possible. The new, cost- and function-effective system will make it possible, and it will make it. It will even bring mass mobility to Africa or East Siberia. It will bring new dimensions of mobility to the whole world. But with solar power only, from day one.*



Marc: *At the third European Futurists Conference Lucerne you will be giving a speech. What can we look forward to hearing?*

Peter: *As a strategic consultant and an innovator, I want to talk about the future of earth-bound global traffic. An innovation of such a potential that it will not only define the successor of the automobile. Within the next 100 years it will even replace trains - because it runs fully automated and you can rent a "shuttle" for each tour you want to undertake - and it will even continental flights: If our grandchildren can go Zürich Peking in just 12 hours, individually, in their own streamliner, "first class" and any time they like, door to door on a high speed track, with solar electric power delivered from the track, why should they then fly "airport airport" and need 16 hours travel time. Not to talk about flights shorter distance than Zürich Peking. They will have just no chance to compete. Not in environmental friendliness, not in comfort, not in travel-times and not in travel costs. So - nobody knows it yet - they mostly all will be gone in a hundred years. There will be "museum-trains" and "museum flights": Nice. But the true traffic will roll earth-bound on the new "silk roads", super fast and tempting.*

**End of the interview**

We invested 20 years of private and idealistic hard work and a private fortune. We overcame all obstacles, to make a better future of human mobility, and hence of humanity.

Now it is proved it can be done. Now it is elaborated how it will look like. Now it is clear what course it will take to get to a bright future of global mobility. Now it is the time to communicate the vision and the system around the world, and to find partners for making it happen.

This proposal wants to attract your attention. It wants to attract the attention of governments and intellectual leaders around the world. It seeks for sturdy and bright partnerships, to make a better future happen. To do so, this proposal is about a „factor 25“ strategy. It is about achieving “5 times more with five times less” by detecting and eliminating futile technologies and replacing them with bionic, nature-friendly, radical-innovative high-tech.

It is in particular about 5 times more worldwide mobility with 5 times less waste of any kind of resources, 5 times less of any kind of pollution and 5 times less people being injured or killed. It can easily be done. It is no theory. The system is already there, developed within 20 years and over 4 vehicle generations. It will be explained in this proposal.



## TARGETSETTING

**OUR TARGET 2008-2012 IS FUNDING ENOUGH MONEY TO MAKE THE NEXT GENERATION OF INDIVIDUAL TRAFFIC HAPPEN.**

**The target is to stop global warming by true innovations.**

**To push necessary changes consequent and fast, we have to continue our 20 years of hard work. In the next four years we will have to invested in all labor and material needed to come up with the following hardware and all related know-how until the end of 2012:**

- **Three 200 mph pure electric streamliner crafts (two-wheel), ready for serial mass production, 25 times as effective as a todays two-seat-car.**
- **One 150 mph pure electric four-seat bionic cars (four-wheel), 5 times as effective as a todays four-seat-car.**
- **One 150 mph pure electric nine-seat bionic car (four-wheel), 5 times as effective as an SUV.**
- **Two 100 mph pure electric two-seat bionic scooters (two-wheel), closed passenger cell, full security equipment and heating as well as cooling system, three times as effective as a todays scooter.**
- **Two 200 mph pure electric two-seat motorbikes (two-wheel), closed passenger cell, full security equipment and heating as well as cooling system, four times as effective as a todays motorbikes.**
- **A 1:5 model track of future high speed traffic, all autopilot and swarm intelligence functions included, 10 model crafts included, model track fully transportable in ocean containers for worldwide publicity events. Track length 200 m.**
- **A 1:1 high speed track, built up at a location to be decided about by our prior funding partner. Track length 500 m. For all two-wheel crafts mentioned before.**
- **Depending on funding volume we can start mass production of easily affordable electric road streamliners within three years.**

**Additionally enhanced know-how will be generated, related to**

- **The tenet of true innovation.**
- **The further development of human mind-set towards change to the better or**
- **the detection of other improvement fields like solar power plants.**



## This proposal is about facing the problems we have today



Fig. 2: © Reuters, WORLD PRESS PHOTO 2007. Photographer: Akintunde Akinleye, Nigeria

*“A Nigerian man rinses soot from his face at the scene of a petroleum gas pipeline explosion near Nigeria's commercial capital Lagos, Tuesday, December 26, 2006. A ruptured petroleum pipeline burst into flames while scavengers were collecting fuel from the underground pipeline punctured overnight by an armed gang who siphoned fuel into road tankers, leaving behind a stream of stray petroleum gasoline for hundreds of resident scavengers. The Red Cross said the fire killed at least 269 people and injured dozens that were trapped and burnt on the ground next to a ramshackle automobile workshop and a saw-mill in the densely populated district of Abule-Egba, an outskirts of Nigeria's commercial capital, Lagos.”*

Akintunde Akinleye, Reuters, Lagos, Nigeria

We burn fuel for 90% futile and insane waste. And we lead wars for “fridges we forgot to insulate”. Future generations might see us in a disastrous light. We plunder 100% of the planets resources for 10% of an effect. We do not say people should not earn money. Thy should even earn more, and more people should participate. A bright future means to have a powerful and prospering economy in place. We want a new mobility to contribute to that power and prosperity. And we want it to contribute to letting more and more people participate, and not less and less.



## This proposal is about making a better future

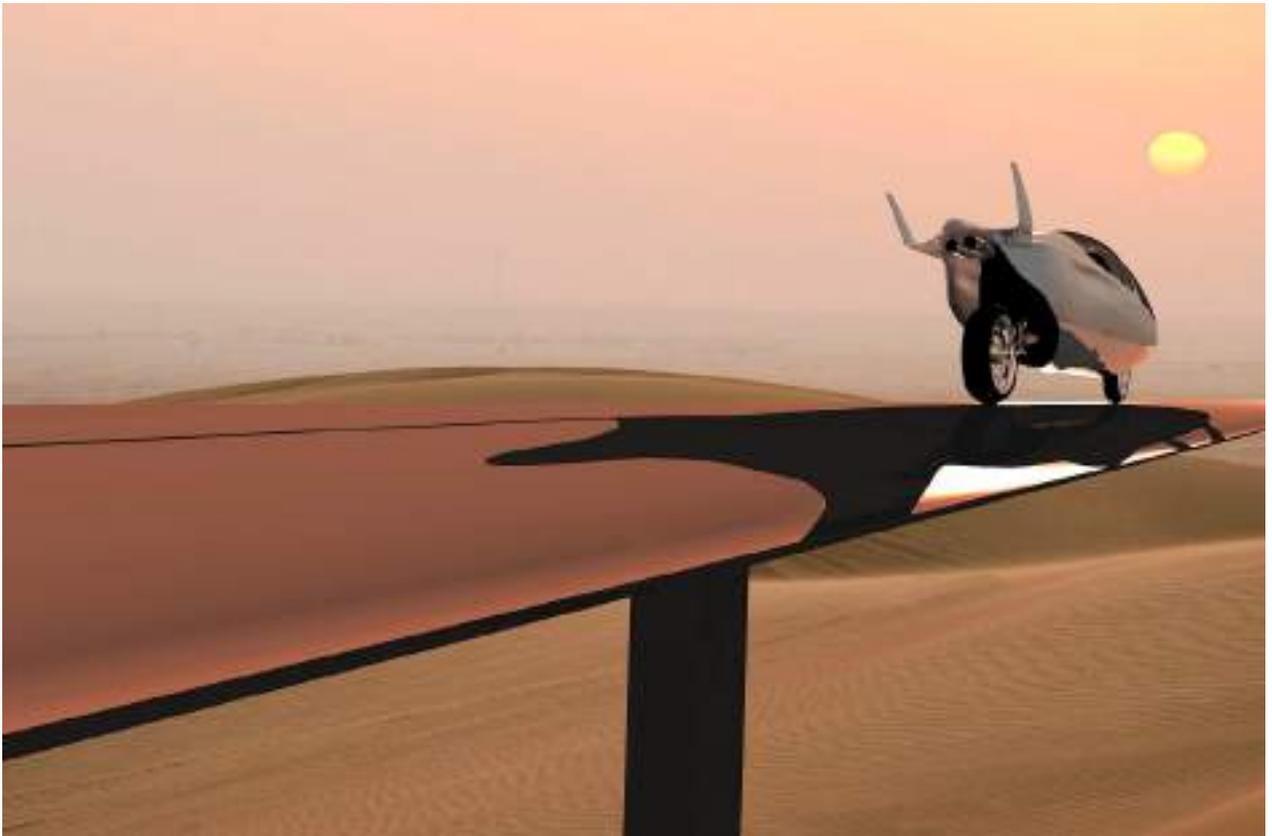


Fig. 3: © Acabion™, Acabion on its new track system, crossing a desert into a bright future

As a law of nature, true innovations can and will come up at the outermost edges of any settled community only. They just come up, where an isolation of a small group effectively took place, literally defining a new 'island' of new kinds of pressure, and hence of new solutions to be found. And even on that 'new island', true innovations still are rare, unpredictable and hard to achieve. This law of nature is no matter of questioning, and its only variable is in the type if the isolation.<sup>1</sup>

As a result, the true inventor is an isolated outsider. And his dilemma is, that the “inside community” will attack him massively, because he does things different, because he is not a part of them and especially and most of it all because they simply “do not allow him to have found out”, what they as some 100 000 or even some million people never came up with. He found it out, anyhow. Because he was the only one with the different viewpoint.

It is time to end the innovators isolation and to let their new concepts pave their way for a better future of both nature and all mankind.

<sup>1</sup> Based on statements of Professor Manfred Eigen, Nobel price winner in chemistry and profound international expert in evolution strategy and continuous improvement, Professor Ernst Mayr, one of the most distinguished biologists of the 20<sup>th</sup> century and Michael Volkema, former CEO of Hermann Miller Inc..





***“Freedom is another word for mobility.”***

**Lenka Mikova, Acabion C.E.O**





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# ***Pages 47 to 157: Complete Acabion Info***





# 1 STOP GLOBAL WARMING AND CHANGE THE WORLD TO THE BETTER, NOW

This proposal is about changing the world, now. Because that's it what it takes to stop Global Warming. <sup>2</sup>

## 1.1 Sometimes, true words are not beautiful...

If we just think about it, we must admit, that the world was changed already. It was changed many times, and many times it was changed in a positive way: Dark and cruel medieval times were overcome by the enlightenment. Monarchies and dictatorships were overcome by democracies, and slavery was overcome by tolerant humanity based on modern constitutions.

So please read this proposal carefully. To set it up, it took us over two decades of intense work and all sacrifices a handful of human beings anyway can summon up. Take your time, and if it takes you weeks.

Keep in the sequence and do not jump over the chapters 2 to four. Study them first, please. They define the "entrance gate to stop global warming". And if they make you angry or you do not agree at all, study them and study the further contents anyhow. Sometimes it is like Laozi said 2600 years ago: *"True words are not beautiful. Beautiful words are not true."* Anyhow, changing the world did never happen with nice words only, and may be it never will.

This proposal is about changing the world in a way, that global warming will stop. Thank you. It takes people, to make things change to the better. We can do it.

## 1.2 True innovations can stop global warming. But how do we find them?

There are several types of innovations. Some can be named „technology-driven“, others „efficiency-driven“.

One example for a „technology driven innovation“ is the upcoming LED headlight technology for automobiles.

A xenon headlight, like we know it since a decade, consumes just 35 W. Now here comes the big and nasty surprise: For the same quantity of light, LEDs need more than twice the energy. The „nimbus of efficiency“ LEDs associate is valid for pocket lamps, but definitely not for cars headlights, where xenon is of vastly superior capabilities.

Additionally, the headlamp LEDs create a lot of heat at the backside of the device. This heat has to be conducted away by separate cooling units. At the headlamp glass on

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<sup>2</sup> *"To have a healthy disregard for the impossible". This is the background motto of this proposal. This motto is well known and widely respected. It is a key element of the success-recipe of companies like Google and their founders Sergej Brin and Larry Page. And what success do they have with it!*



the other hand, LED's will keep things cold, what turns out to be a negative effect: The glasses get fogged. So they must be actively heated by an additional heating foil.

Xenon lamps keep the headlamp backside cool and warm up the headlamp glasses. They don't need such additional devices.

In the end the LED car headlamp will be more expensive, more complicated, bigger, heavier and less efficient than a xenon light. The „progress“ is: „THE LED HEADLAMP IS NEW“. Well, give me a break.

This example shows that there are a lot of so called „innovations“ around that bring efficiency two steps backward. So, as long as anyone can use the word „innovation“ for everything he likes, if it is that is just „new“, there will always be many of „new“ but totally useless or even harmful „innovations“.

For marketing and image reasons, and to give the press what it always asks for, „something NEW“, the LED car headlights will come, at least for upper class vehicles. Such innovations cast a (very sad) light on how car industry thinks and acts in a time of progressive global warming – at the same time self-praising their “advanced mind-set”.

Car industry tends to come up with solutions being complicated for the complications sake, or being new for the sake of “new”. This is the opposite of what any smart bionic approach would be, and this will not stop global warming. It will make it worse.

To stick with the chosen example: An efficiency driven innovation was the xenon light towards the halogen light. Xenon is brighter, offers more contrast, consumes less energy and the bulbs live much longer. Even in an overall balance, the additional effort for the electronic control unit can be compensated.

For nature’s and its resources’ sake, and to stop global warming, we talk about „efficiency driven innovations“ in this proposal only.

The sense of „innovations“ like the LED headlights can be generally doubted: They are useless for nature, and hence – latest in the long run – a risk for mankind. To make things worse, they take away resources of work and money from useful innovations that get stuck in a concept state due to lack of financial power and publicity.

**We name efficiency-driven innovations that reach new dimensions of efficiency by breaking old conventions the “true innovations”.**

We repeat:

- True Innovations are efficiency-driven, and
- they reach new dimensions of efficiency by breaking old paradigms

To give some more practical and distinct images of how reality up to now looks like:

Rocket scientists will tend to name a new rocket “an innovation”. But the true inventor will NOT come up with a new rocket or some new equipment for a space station. He comes up with something more efficient, that makes both rockets and space stations futile. And man, will he be attacked for what he does. His articles will be eliminated from



online dictionaries or at least cropped to a useless fragment, suppressing the facts and making his innovation exactly look how they see it: Crazy.

Car industry will tend to name a new car or even a new kind of LED headlamp “an innovation”. But the true inventor will NOT come up with a new car or with a new engine for a car or with some new equipment for cars. He will come up with something more efficient that makes cars futile. And man, will he be attacked for what he does. No “professional” journal will report about him and if he tries to contact them, within decades they will not even reply to one of his e-mails.

The pharmaceutical line of business will tend to name a new influenza pill “an innovation”. But the true inventor will NOT come up with a new pill. He comes up with a cure that is more efficient and that makes pills futile. And man, will he be attacked for what he does. The “professionals” will just wait him out and when he died, destitute and hardly known by anyone, they will come up with critical and contemptuous articles about “non-pill-cures”, if they did not start that long before.

We talk TRUE INNOVATIONS here. That's what makes it so difficult. But since GLOBAL WARMING will not be stopped by “LED headlamps”, (most likely on a bigger and heavier car than it was before...) but it will be stopped by true innovations only – true innovations of human behavior included - mankind will have to deal with it. Especially the leaders of the old communities will have to. They are the ones who grew very rich within the old paradigms and they must find new ways, not to use all their enormous might any more to – knowingly or unconscious – suppress true inventions. They must, because if they don't, they suppress nature and hence the future of not only the human race. This might be the most important true innovation mankind is still waiting for: To change the way big money is used. Change it from solely investing into cores of old communities and old paradigms into partially investing it into the outer edges, outside of companies, outside of universities, outside of any old structure or paradigm, but inside an innovative “true innovation system” that will be described in this proposal, too.

If we manage to make it right, we will stop global warming and at the same time make humanity rise to a new level. If we fail to stop global warming, global warming will stop us.

### 1.3 True innovations and the laws of nature

As a law of nature, true innovations can and will come up at the outermost edges of any settled community only. They just come up, where an isolation of a small group effectively took place, literally defining a new 'island' of new kinds of pressure, and hence of new solutions to be found. And even on that 'new island', true innovations still are rare, unpredictable and hard to achieve. This law of nature is no matter of questioning, and its only variable is in the type if the isolation.<sup>3</sup>

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<sup>3</sup> Based on statements of Professor Manfred Eigen, Nobel price winner in chemistry and profound international expert in evolution strategy and continuous improvement, Professor Ernst Mayr, one of the most distinguished biologists of the 20<sup>th</sup> century and Michael Volkema, former CEO of Hermann Miller Inc..



As a result, the true inventor is an isolated outsider. And his dilemma is, that the “inside community” will attack him massively, because he does things different, because he is not a part of them and especially and most of it all because they simply do not allow him to have found out, what they as some 100 000 or even some million people never even imagined. He found it out, anyhow. Because he was the only one with the different viewpoint.

## Anyway we look at it:



**Global warming will stop us if  
we stop true innovations.**





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## 2 PRELIMINARY REMARKS

### Remark A)

#### **This proposal is about stopping the global warming**

If mankind will not alter its path, global warming will continue. Hence we have to change our way. But caution: If the “name tag” on a chosen future trail is just “innovation”, that is not the new path. To decide for it would just lead to “walking the old path surrounded by just virtual changes”. And that will not help. The new path will be named “true innovation”.

This proposal is about what it really takes, to stop global warming: It is about true innovations, it is about the skills needed to make them happen and about the boldness indispensable to launch them within big organizations, throughout an entire society and finally all around the globe.

### Remark B)

#### **This proposal is about letting go of things we loved**

As a space to live, for our beloved ones and for ourselves, we often think about the nice flat we name our own, might be with a lovely little balcony, or may be we even think about a dreamy garden and that comfortable house. We love those places with all their meaningful and magic details. We love what they are standing for in our lives, and we do not want to let them go.

And as we know there are more things we love: For instance we love our beautiful cars. No doubt, they are fascinating, cozy inside, sportive in their potential, in some cases luxury, protecting, very elegant and comfortable. More than being an element of our individual history, they are part and parcel of the vivid and intense human dream to be mobile and free, as an individual, at any place and any time.

Our cars are not as safe as we believe, because if they were we would not loose a beyond devastating 1.2 million human lives each year, with a disastrous upward trend.

But as we meanwhile know, our cars became part of the global warming threat, and – as a result – we will have to let them go.

This is the bad news. The good news is: In the moment we let them go and enter that one path named “true innovation”, there are new crafts already waiting for us. And very soon it will be Millions of them. One for each of us. Brandnew and extremely beautiful. Sparkling in the sun and tempting in their powerful look. Thrilling in their unimagined environmental friendliness and comfortable as can be, extremely safe due to autopilot functions and preventive safety strategies. Fast like airplanes and with a dynamic high speed potential beyond formula 1 race cars. That does not sound so bad, does it? The only thing is: They are different to cars we know today. Very different. That's why their



path is not just labeled “innovation”. That is why they are waiting for us in the “true innovation road”.

If we would try to keep our cars too long, we will not discover the new crafts waiting for us. Figuratively they will be like children we did not have, like chances that came up for just a moment and were not used or like wonderful dreams we went through but we never remembered. And as another consequence of failing to let go of our traditional cars fast enough, we might lose what we love more, may be even our “sweet homes”. Because they were swept away by storms or fires, ocean waves or political disasters, because we could not heat them anymore in winter or cool them down in summer, or because a landslide brought them down. And finally, if we don't let go our cars, they probably will turn around and let go us, resulting in being forced to let go our cars anyhow.

### Remark C)

#### **This proposal is about behavior of mankind facing true innovations**

As a law of nature, human beings go through four stages, whenever new things come their way: 1) ignore as long as you can. 2) attack hardly and in any case. 3) start thinking about it and 4) getting used to, and accept it as part of the “new world”. Hence, as soon as they can not continue ignoring, human beings will start attacking anything new they have to face. “New” is different compared to what they were used to. And they do that knowing to be the secure majority, and hence they do it open and they articulate it loud and clear. As an example “totally crazy and absolute insane!” was said loud and clear in 1800, when the railroad was invented, and again it was said loud and clear in 1900, when cars came up. And one thing is for sure: Nothing has changed in these behavioral terms. So if – facing a new technological solution today – we do hear a sentence like “totally crazy and absolute insane!”, or if we tend to say it by ourselves, exactly this proves best, that we are facing a true and fundamental innovation again. If we do not hear it on the other hand, this is the most significant indicator proving that we might be surrounded by many things, but that what we face is anything except a true innovation.

What big companies name „innovation“ in TV commercials or press conferences and articles today is fine-tuned to be sold and hence NOT to generate any kind of rejection. This proves that they do not come up with any true innovation. Here we see a part of the phenomenon Manfred Eigen mentioned when he said, that true innovations never come up out of the center of established organizations.

As an example, a „LED headlamp“ is no true innovation at a car. A traffic system without the need of headlamps would be a true innovation. A system like migratory birds have it: They do not fly „with headlamps“, even in the darkest night. Anyhow: A vast majority would say loud and clear “crazy and totally insane! We want to keep our lamps!”.

Each true innovation is an invention, but most inventions are no true innovations. Hence true innovations are rare and hence to deal with them is one of the most tricky issues mankind can face. And since it is so tricky, mankind in most cases tends to avoid true innovations and to beware of being confronted with them.

**Anyhow: Trying to stop global warming while sticking to the “old way” will be like an attempt to “stop pain by torture”.**



## **Remark D)**

### **This proposal is about a „factor 25“ strategy**

It is about achieving “5 times more with five times less” by detecting and eliminating futile technologies and replacing them with bionic, nature-friendly, radical-innovative high-tech.

It is in particular about 5 times more worldwide mobility with 5 times less waste of any kind of resources, 5 times less of any kind of pollution and 5 times less people being injured or killed. It can easily be done. It is no theory. The system is already there, developed within 20 years and over 4 vehicle generations. It will be explained in this proposal.

## **Remark E)**

### **This proposal is about remembering Leonardo da Vinci**

Leonardo da Vinci once said: *"Simplicity is the ultimate sophistication"*. So here comes a simple but sophisticated fact: It has physical reasons that a lot of things – and most life forms – look like they do. Birds look like birds because they adapted to physics of flying. Dolphins look like dolphins because they adapted to physics of swimming. They especially do, because they have to be efficient. They would not survive otherwise.

Question: How will the future of individual, earthbound traffic look like? Will it look like a pickup truck, huge and heavy? Or like an SUV, big and impressive? Will it look like a limousine, still 20 times as heavy as the one human being that in most cases is its sole passenger? Will it look like a bicycle, man powered again? Or like a rickshaw? Well, may be not. Distances we have to and we want to travel are big, so we need too much speed to handle that with manpower.

Or will it look "bionic"? Beautiful, new, surprisingly elegant, "stretched out in the winds of change"? Adapting to nature, instead of offending and plundering it? Well, it sure will be a true innovation and a true bionic, hightech design. And it will look like this:



Fig. 4: Acabion road streamliner.

The high-speed and long-distance shape of the 21<sup>st</sup> Century traffic



In Leonardo da Vinci's sense, the reason why it will look as shown in Fig. 1 is simple: It has physical reasons. That is why the future of continental traffic – worldwide – will look as depicted in this paper. It is a simple truth – and hence it is ultimately sophisticated: It will look like Fig. 1, because it has to adapt to physical needs of earthbound mobility. And it will – this is the major difference to "cars" – because it has to be efficient.

- It will be a lightweight construction to save resources.
- It will have its seats behind each other, to reduce energy consumption by reducing the amount of air that constantly has to be displaced.
- It will be shaped like a dolphin not to generate futile turbulences.
- And it will have two wheels simply because a two-wheel design is the more simple and hence the more sophisticated solution, compared to a four wheel design.
- By using mechatronic balance actuators it will be smart enough not to fall on its side. It is the same like in bionics: The higher developed, the less legs and the better abilities to balance. Simple, but true. We all know it since we learned to walk on our two legs.

The effects of a concept as depicted in Fig. 1 sum up to a 10- to 25 fold increased efficiency. In other words +1000% to +2500%. Where a state of the art "sports car" does e.g. 150 mph at 8 miles per gallon, an Acabion road streamliner will manage the same speed at 80 mpg up to 400 mpg, depending just on how consequent its innovative technological path is followed further on. And it will do so offering better comfort and more safety to its passengers. 800 mpg at 150 mph? And with better comfort and safety? "Crazy and totally insane"! Well, as Remark B) emphasized, this "feeling we have here" is the clearest indicator that NOW we face a TRUE innovation.

Additionally these 800 mpg potential comes along with an energy need of just 14 KW at 150 mph speed, compared to 151 KW for the "sports car". These facts speak to us. And these facts mean 10 to 50 times mean that we can stop global warming. And hence there is not even a question at all, if the future system of continental traffic as depicted in fig. 1 is an assumption or a fact. It is a fact as long as physics will not change, and it is as long as we mean what we say, when we say "stop global warming".

The Acabion team will continue to launch it, as the potentially biggest, most efficient, most profitable and most vibrant chapter of human earthbound mobility, ever.

The traffic system depicted in this proposal was first sketched in 1986, transferred into the first prototype generation in 1993 and to a generation II in 1997. From 2003 onwards, a generation III came up, ready for permitted road operation. Generation IV is on its way since September 2007.

## **Remark F)**

### **This proposal is about courage and about massive changes**

The story of modern land bound mobility is easy to narrate: 1800 came up with the railroads. 1900 came with cars and streets. We write 2007 now. So what are we waiting



for? 21<sup>st</sup> century must come up with a sustainable system of bionic streamliners, bionic tracks and bionic traffic intelligence as depicted in this paper.

It is a matter of profound improvement strategies that if a system turns out to be far away from an optimum, big steps have to be taken to improve the entire situation fast. This means: Who sees a risk, that global warming might turn out as a big problem, automatically has to accept the fact, that big steps will be needed to improve the situation.

### **Remark G)**

#### **This proposal is about tough targets and a "three step approach"**

Step 1: Clearly locate the "core-efficiency" of major technologies

Step 2: Massively increase that efficiency, and do it fast

Step 3: Based on 1 and 2, massively spread the common use of solar electric power to 75% of all used energy within 25 years

### **Remark H)**

#### **This proposal is about solar energy PLUS its intermediate accumulation**

The longterm energy supply concept of the depicted future traffic system innovation is pure solar electricity. It will be transferred either – at a standing streamliner – directly into its batteries or into the high-voltage transmission line of a future high speed track and from there into the moving vehicles.

The tracks are a part of the depicted traffic system, too, as well as innovative current collectors and other required elements.

The mentioned „Zebra“ high-temperature batteries have a positive environmental overall balance: They are to be recycled without any trouble and cannot burn or explode. Anyhow, they are just one example of how electricity will be stored in the vehicles. Lithium polymer can be an option, but not lithium ion due to its fire or explosion risks. As soon as Nano technologies come up here, they can be used, too.

### **Remark I)**

#### **This proposal is NOT about offending customers**

We are not offending the customers. Not at all. The succeeding arguments against big, wide, edgy and heavy cars are arguments against car industry. If it comes to automobiles, markets do not define products. It is car industry, whose top professionals studied automotive engineering. And they (should) know what is right and wrong about

- sizes,
- forms,



- masses
- and aerodynamics

of the vehicles they come up with. Car industries top professionals (should) have the skills. And even if they do not, they anyhow do define the products. The market does not. The market does not have the skills in professional engineering, physics, mathematics or chemistry to say how a car must look like. Car industry staff – not the market – operates the embossing machines that finally again and again stamp „the technical spirit of times“ into automotive mass production „design“.

An important supplemental role in this context is with the communication media. What they say that is „sexy“ most likely will be seen as sexy, and what they say is „out“ most likely will be out. Often enough, as some of us know – the media are not totally free. They depend on advertisement budgets and hence they tend to avoid offending the ones that frequently pay that huge money for those „full-page advertisements“.

#### **Remark J)**

#### **This proposal is about changing the worlds mind-set to the better**

Stop Global Warming can be done. The impediments are NOT in technology. The impediments are in MIND SET. This proposal is about establishing a new worldwide traffic system to achieve two major effects: 1.: **Stop Global Warming caused by traffic**, and 2.: **Stop Global Blindness towards the ability to positive changes**.

#### **Remark K)**

#### **This proposal is about fast action and longterm responsibility**

We go for mass production of highly efficient and affordable electric crafts PLUS a bright infrastructure. The issue hence is both fascinating and tremendously profitable.

#### **Remark L)**

#### **This proposal is about applying both bionics and evolution strategies**

Nature shows how to solve a technical problem AND what strategy to choose to carry it into a global effect. A part of the strategy is, that – as mentioned under Remark F – big steps have to be taken facing big problems. The other message is, that small steps will not lead to "a little bit slower, and hence still acceptable improvements". It is a law of nature, based in scientific evolution strategy and genetic algorithms, that too small steps facing a big problem sum up to ZERO. Hence it clearly has to be identified, if there is a risk that changes happening are too small. This issue is tremendeously important.



Hence part of this funding proposal as well is to do clever and target-oriented research on evaluating step sizes of innovations.

It can not be ignored, that step sizes can be too big as well, in theory. They can not in practice, as long as they are launched carefully.

**Remark M)**

**This proposal is about learning**

Mankind does have some knowledge about "what companies name innovation". But mankind has no conception at all about the "tenet for innovators".

Hence this proposal includes the basic research necessary to generate a sophisticated "tenet for potential innovators". This is serious business. How serious gets clear, as soon as we count Google hits about "I want to become ...".

Search term	Google hits
„I want to become a star“	125 000
“I want to become a psychologist”	78 600
„I want to become a journalist“	62 900
„I want to become an artist“	54 300
“I want to become a musician”	53 700
„I want to become a scientist“	53 200
„I want to become a politician“	49 000
„I want to become a manager“	46 500
„I want to become a writer“	36 700
“I want to become a vampire”	32 700
„I want to become an engineer“	27 200
“I want to become a preacher”	27 000
„I want to become a doctor“	15 000
„I want to become a magician“	13 400
„I want to become a teacher“	11 200
„I want to become a boxer“	7 660
„I want to become an astronaut“	7 550
„I want to become a lawyer“	567
„I want to become an inventor“	6
„I want to become an innovator“	0

Chart 1: Google hits on "I want to become ..." (status October 22<sup>nd</sup> 2007)



Chart 1 points at a true and gigantic disaster. There are half a million hits on wanting to be a star, a teacher, a politician and so forth. Only 6 are left for an inventor, and ZERO for the innovator. And there is a huge difference between an inventor and an innovator: The inventor invents the "250<sup>th</sup> version of a screwdriver". The innovator replaces the screw.

To be "an innovator" definitely is a profession. And it is one of the most important professions of all. An innovator is a brave, unique, bursting with energy and totally independent individual, full of weird ideas, concepts, knowledge and phantasy, full of silly questions, that are not silly at all, and full of new ways to see and to solve things and loaded with new, exceptional solutions. An Innovator is a human being of markedly individual character, exactly like Leonardo da Vinci was. He is the "man with the new idea" Mark Twain had in mind when he said: "The man with a new idea is a crank until the idea succeeds".

But mankind totally forgot about the profession of the innovator, and hence it lost it. It assumes, an innovator is "an enterprise", an organization or something else anonymous. But it is not. It is as little as a "hospital" is a "doctor".

The analysis works with other search terms, too. E.g. "the profession of a teacher" delivers 18 100 hits, "the profession of a doctor" 14 400. "The profession of an inventor" as well as "the profession of an innovator" both deliver a plain 0.

There are some few hits on "I study innovation". The studies they refer to deal with the issue of innovations, but they clearly do not generate people who would see themselves or who would be seen or named by someone as "a professional innovator". In German language this field of study is called "innovation management". It is like people would study "hospital management", but no one would become a physician.

As we see, there is a profound challenge: We have to invent the "profession of the innovator". We have to innovate our education systems in a way, that they start creating innovators. To solve the problems of the future we really have to educate young people to become innovators. At least some of them, if possible the most gifted ones. And hence we have to invent the "tenet for the innovator", plus the concept of how a society has to organize itself to get along with innovators, and not to eliminate them as soon as the first of them appear.

The team behind this proposal works on this issue since 15 years, with tremendously interesting and important results. (Like "Chart 1").

So this funding is not just about "building a new car" and "an entire new traffic system". It is more than that: It is just "using the case study of a (r)evolutionary innovative traffic system for the 21<sup>st</sup> century" to come up with general and basic new knowledge and tenets about innovations and innovators as such.

One of the targets would be, to generate a profession that is not yet existing, but that could be essential to handle the risks of the future, and to tackle them faster, more effective and more skilled.

What we see today, as the global warming is closing in on us, is a total lack of professional innovators. And hence the reactions that come up are small, hesitating, not at all resolute, and in many cases even contra-productive, latest if we look at the overall effect. What sense makes one single 250 mpg prototype Volkswagen, if at the same time the Volkswagen based Bugatti Veyron goes into serial production, as a 2.5 mpg anachronism, anyhow defining associations of automotive ideals in children's minds.







***"Every great dream begins with a dreamer."***

**Harriet Tubman**





### 3 COVERING LETTER

Dear ladies and gentlemen,

this proposal describes how to stop global warming and how to ensure individual mobility for generations to come. A fundamentally new traffic system will offer it all:

- Increased climate- and resources protection and reduced energy consumption,
- increased dynamics and reduced travel times,
- increased safety and reduced pollution,
- increased beauty and fascination and reduced risk of accidents.

And it will do so in total, even if overall traffic volume will massively increase. Bionic consequence as well as profound, true innovations make this system 10 to 25 times (+1000 to +2500%) more economical than today's cars. No miracle is needed: Physics and existing key technologies offer all of the necessary preconditions.

The progress in efficiency is of such a degree, that the depicted system can overleap hybrid engines as well as hydrogen-, ethanol- or other combustion technologies and offers the chance for a "single step to pure solar electricity" approach..

The new traffic system offers huge chances to the ones who will make it happen. The chances are as follows:

- After horse drawn carriage (as a generation 1) and cars (as a generation 2), the new system will define the "generation 3 of earthbound, individual mobility",
- within just one decade, it will boost the general mobility potential to a new, dimension, with massively positive economic as well as life quality effects,
- it offers learning effects about skills needed to make true innovations happen,
- it will dramatically lower the number of people injured or killed in traffic accidents,
- it will lower the costs for new traffic connections by a factor 10,
- it will develop new regions for living due to new traffic links,
- midterm it will reduce the number of continental flights and substitute them by more economic and much less polluting earthbound highspeed operations,
- the systems new, elevated tracks will keep biotopes untouched,
- the quality and the attraction of traveling itself will increase due to a totally different and much better view into nature and countryside,
- longterm the system will offer fully automated „shuttles to rent“ at any place and for anyone and hence it will fundamentally innovate public traffic, too.

Lucerne, November 9<sup>th</sup> 2007

Dr.-Ing. Peter Maskus, Acabion™





## 4 ACABION PEOPLE

### 4.1 The projects network

The Acabion Project includes a network of international partners and suppliers, such as Glass Trösch in Switzerland for the canopies, Carbon & Design in Germany for the composite body structure, Carrillo or JE in the USA for connecting rods and pistons, turbosmart in Australia for boost control, MHI in Japan for the turbochargers or Maxon in Switzerland for the electric drive systems.

### 4.2 The core team

The most important about the Acabion project is its team. For Peter Maskus as the Acabion founder there is nothing more important than the friends who gathered around the vision. The Acabion is about bringing people together and creating friendship. Talking about the inner Acabion team, it already started to work.

The core of the Acabion team consists of a handful of marvelous people. Our Human Resources credo is to be global. There is Daniel Tomicic from Zagreb. He is the mastermind of PR, VIP contacts and funding. Angelos Pavlidis is the mastermind of logistics. He is from Athens. There is Mihoko Hakata from Tokyo. She is our mastermind of arts and lives in New York, together with Brandon Welti, our creative director and US representative. There is Lenka Mikova, our CEO, she is from Prague, and she is responsible to run the company and the project, she is our mastermind of marketing, human resources and continuous improvement. Lucas Marchesini from Lugano is our mastermind of aerodynamics and special electronics. Judit and Marcus Hundt from Stuttgart are our acoustics experts. Armin Strassburger and Paul Jelko (Rainbow Audi) are the masterminds of the sound system. There is Philipp Zabel as the mastermind of physics and IT, Jakob Zabel as the mastermind of Acabion in the Internet, and there is Oliver Aigner, CARTFT Munich, our mastermind responsible for the on-board computers. There are a lot more fine people, but due to some latest research going on, some regions of the "Acabion home" are not open for the public right now.

### 4.3 The Acabion C.E.O.

Lenka Mikova was born March on 26<sup>th</sup>, 1976 in Zlin, Czech republic. She learned to know the totalitarian system and the change to democracy and free market economy.

Her love and respect of nature was firmly established by her parents and grandparents. She was doing high performance sports from the early age. Being devoted to natural sciences and mathematics, she participated in school Olympics in biology and math-



ematics every year. Later, she studied economy, finance, and marketing and won a EU-scholarship for a MBA study in Great Britain. Even before finishing her study, she was engaged by Accenture in Prague and instantly sent as a Czech republic representative for the International student leadership conference in St. Charles, USA. Some months later, after finishing her degree dissertation in Vienna, Austria, she finished her study with a summa cum laude degree.

In 2000, she met Peter Maskus during a Kaizen study tour in Japan and from 2001 onwards, she worked with him as a consulting partner.

Due to constantly increasing workload of the Acabion project, Lenka Mikova stopped her consulting activities in 2006 and since then fully supports traffic system project both in Lucerne and at the side of system partners and suppliers around the world.

#### 4.4 The Acabion inventor

Peter Maskus was born on April 25<sup>th</sup>, 1960. Since early childhood, he was fascinated by both nature and technology.

In 1972 he learned to know Dr. Prinz (later CEO of Mercedes-Benz) and Prof. Fiala (C.Res.O. of Volkswagen) privately and hence could pick up first direct impressions about car industry management and technology for several years and in a quite intense and unique way, especially taking his age at that time into account.

In 1977 he started studying engineering, economy and bionics in Aachen, Karlsruhe and Berlin. In 1990 he was hired by Porsche in Stuttgart. He learned to know Ferry and Alexander Porsche and in 1993 he personally explained to them how future cars should look like and suggested, that bionics and efficient design should play a much more significant role. In 1995, Peter Maskus was hired by Masaaki Imai's Kaizen Institute - a top lean production and continuous improvement consultancy in Tokyo, and became one of the key experts in Toyota production system and Kaizen.

He ran Kaizen- and lean production-projects at several leading companies around the world. In 1997, he founded his own consulting group, leading Kaizen- and innovation-projects in Japan, Italy, England, the USA, China and Germany, especially a very intense and long-term improvement project with Mercedes-Benz car group. Other contacts were made to General Electric, the NASA, GM, Ford, Honda, Toyota and Ferrari as well as industries like heavy industry, pharmacy or electronics.

To bring commonly known management systems to a next higher level, he initiated personal high rank contacts to people like Nobel prize winner Prof. Manfred Eigen (evolution strategy) or Prof. Ingo Rechenberg (Bionics). After these contacts, within five years Peter Maskus summarized all known successful management approaches and harmonized them under one roof of evolutionary strategy. Additionally he sees bionics as the essential key to high-potential and environmental friendly technical solutions. In parallel to his consulting career, in 1986 he started working on true innovations for the 21st Century. As one outcome, his new global traffic concepts went through four generations of constantly improving revolutionary crafts, meanwhile achieving airplane speed in an environmental friendly way.



## 5 IDEALISTIC VIEWPOINT

*“I hope, one day humanity will comprehend, that we are not the passengers on planet earth, but the crew— and that together we have to find our right course”*

Muhammad Yunus, winner of the Nobel price of peace 2006  
and founder of the Grameen “microcredit” Bank

The course of mankind is easy to define: Tolerance, understanding and peace. Hence it is all about education. And is it not so much easier to learn, if one is able to visit places one should learn about? No matter if that is a physicians laboratory, a foreign country or a museum?

Modern brain research makes it clear without any question: Learning is about motivation and motivation is about “getting in touch”. That is a reason why mobility is such a crucial part of the “right course” of humanity: Without mobility, learning of mankind will be difficult. Without mobility, a course even makes no sense. Finally, without knowing ones ideals even “moving around” will not unveil a preferable direction.

To make a “right course” decision in a social, ecologic and and economic sense, just like Muhammad Yunus meant it, for each subsystem there has to be found an own “right course”, too.

The course of mobility is easily to be defined. It is “right”, as soon as it is perfectly efficient in all possible aspects. We will elaborate on what this means:

First element an earthbound craft needs is a wheel. To make it part of a perfect system, there has to be a streamlined cover around it:



Fig. 5: Wheel. Element no. 1 of any earthbound craft, shown with a aerodynamic cover



It can take two, three or four wheels to make up a useful long-distance craft. And in any way we look at it, in the same consequence of a wheel being always round, a streamlined body always is shaped like a drop. It has physical reasons, why this is the only shape that minimizes energy needed to be moved through an atmosphere. So: As long as movement is the core task of a craft, as long a drop shape will be its ideal form.

The next fig. shows, how two to four covered wheels plus a streamlined, drop-shaped body can be arranged. There can be a four-wheel, a three-wheel with one plus two wheels in front and rear, a three-wheel with two plus one wheel in front and rear, and a two-wheel as shown at the right side. To make things easier to understand, the crafts are shown in a virtual, transparent mode, too:

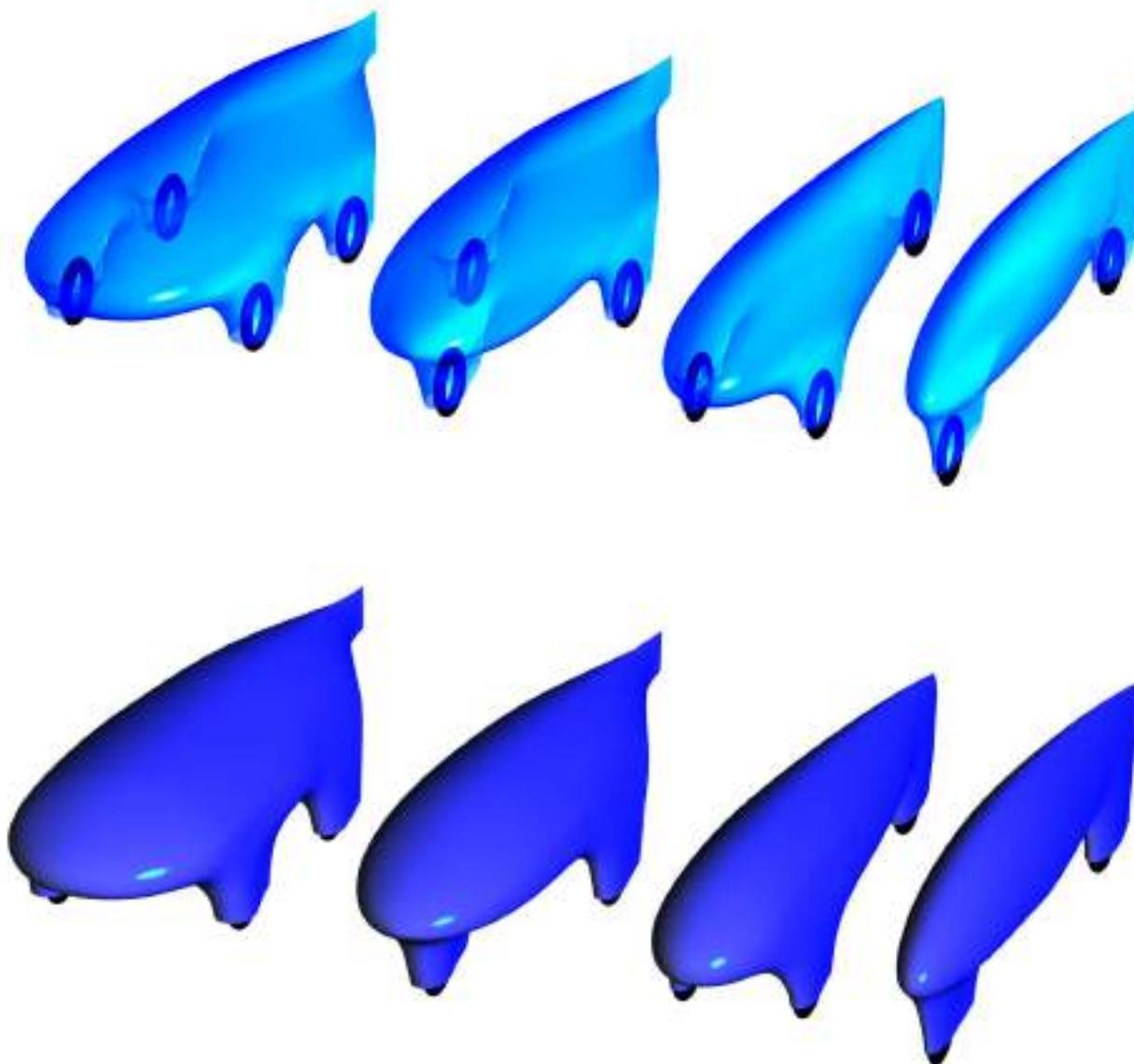


Fig. 6: Wheel configurations, crafts in transparent an non-transparent mode

Computational fluid dynamics / “CFD” can be used to calculate the aerodynamic characteristics of each craft. After several steps of modifying forms and reducing aerodynamic



drag on a flat road to an absolute minimum, one thing turns out: The shapes get a “wing profile” as shown in the next side-view:

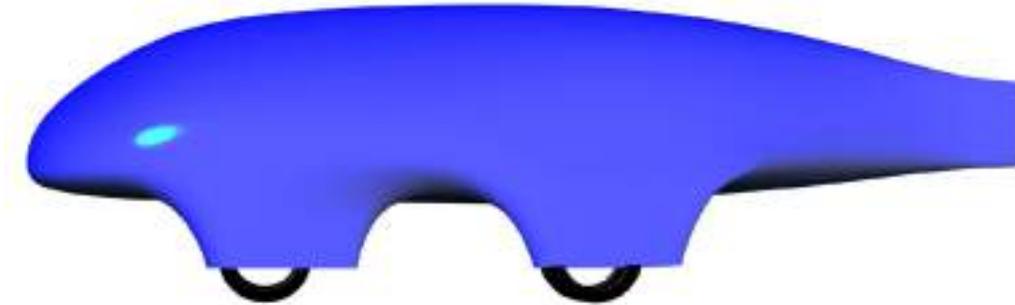


Fig. 7: Side profile of an optimized four-wheel craft

Reason for this effect: It is easier to lift some more air over the body, then pressing it between craft and road. Hence the lower side is almost flat, and the upper side is bended “to lift air over the craft”. This is no problem for a vehicle rolling at 20 mph like an “Eco-Marathon” craft. But it turns out as a big problem as soon as speeds increase. Now the craft will tend to develop upward forces and it will tend to take off, turn over and crash. Ideal solution and hence “the right course”: The two wheel craft:

1. It is so slim, that airflow under the craft is least disturbed, even if the lower side is bended to avoid upward forces, and
2. even if there would be upward components, their effect would be drastically reduced since the two-wheel craft provides the smallest surface.

And there are even more reasons for a two-wheel craft to be the ideal: It needs the smallest number of components, it is the literally smaller threat to other participants of traffic. A pedestrian having the choice either a sports car or a two-wheel frontally crashing into him, will decide for the two-wheel, because most likely it will not hit him at all. It is too small. Its front center is just one inch wide, and the rest is totally rounded.

More advantages: A two-wheel makes the best use out of physics and laws of nature. It even uses the gyroscopic effect of the wheels, that is a perfect stabilized for higher speeds, and that stays completely unused in a three- or four-wheel craft.

On top of this they provide the smallest possible projected area and hence save additional energy.





Fig. 8: All but a random decision: For efficient and high speed mobility, the two-wheel concept is vastly superior to any other craft

**It has soundest reasons, why the following chapters about true traffic innovations favor bionic and (r)evolutionary innovative two-wheel crafts.**





***"The right to speak out is also the duty to speak out."***

**Vladimir Pozner**





## 6 STATUS QUO OF WORLDWIDE ROAD TRAFFIC

### 6.1 STATUS QUO OF AUTOMOTIVE ENGINEERING

Automobiles came up around 1886, derived from an existing technology (carriages) combined with a partial innovation (the combustion engine). For example, Gottlieb Daimler ordered an original horse driven carriage at Wimpf in Cannstatt. He built the first four wheel car by removing the draw bar and implementing an engine.

Ever since, the paradigm „passenger car = passenger cabin on four wheels“ is deeply held in people minds. If we like it or not, until the present day cars are still in the same paradigm pattern as carriages.

If someone tells us: „Here comes a riddle. It has two wheels in the front, two wheels in the back, the front wheels can steer; it offers seats in one, two, or three rows behind each other, it has doors at the sides, a size of about 14 feet long, 6 feet wide and 5 feet high. What is it?“ We would be not able to tell if it is a 1785 carriage or a 2007 car.

Cars components were innovated, such as steering-mechanics, suspension, wheels, tires, or the brakes. Other components were added, such as windscreen wipers or a radio. But never ever in more than 120 years, the most basic question of all was answered: „How should the entire „system car“ look like to be the most useful for its major task of providing mobility to mankind? This question was never answered – or maybe not even asked. And this is a physical disaster that caused huge global waste of resources over more than a century and that is partially responsible for disasters like global warming. What happened was that the „non-horse-carriages“ got stronger and stronger engines and thus achieved speeds carriages were never designed for. The next chapter offers a closer look at what this meant for the physics of driving:

#### 6.1.1 Efficiency and dynamics of earthbound vehicles

Here comes all the related physics we need. Each earthbound vehicle is physically determined by five factors:

1. A car's area we seen looking directly at its front is equivalent to the quantity of air that has to be displaced all the time. This displacement consumes energy.
2. Cars body forms induces turbulences, consuming additional energy.
3. Its weight means inertia that has to be hurdled with each acceleration. This process will always be a lossy one, even in hybrid concepts.



4. The rolling resistance (partly depending on the vehicle weight) equals energy losses by constant deformation of the tires.
5. The engine delivers – again as an always lossy process – is the energy the vehicle needs as a result of factors 1) to 4).

The first four factors stand for more than 95% of any earthbound vehicles overall mobile potential. But taking into account what “five athletes on the way to their training camp” need for their comfortable and safe transport, even our “compact cars” projected areas are too large by a factor 4, their forms too awkward by a factor 5 and their overall constructions too heavy by a factor 6.

In today's cars those five athletes are seated two next to each other in the front and three next to each other in the back. But if an eight-man scull is transported on narrow country roads without any problems, why can't two to five people be seated behind one another in a new type of slim, truly effective car? There is no reason why they could not. They can. All it takes is a new car paradigm. The change has to take place in our heads.

Such a future „jet-like car“ would have a projected area of just 0.6 m<sup>2</sup>. Our today's cars have 2,4 m<sup>2</sup>. That is the area of a supermarket entrance door crosswise in the wind. On top of that, cars quality in terms of turbulences can be easily improved by a factor 5. The only thing we have to do is using bionic „fish“ or „bird“ shapes instead of the usual „new edged old carriage“ designs. And the weight? Even a today's „compact car“ comes with an own mass of 1400 kg, i.e. Empty. Nevertheless, despite its weight, it can be loaded only up to 400 kg. This is a disastrously bad weight to payload ratio. A future effective vehicle should have a weight to payload ratio of at least 1:1.

The unchangeable physics of driving superimposes all those effects to overall efficiency losses by a factor of 5 to 50, depending on how consequent we get in our optimization approach. If we take a first rough average, a factor ten is absolutely realistic. This means that our today's cars consume at least ten times more than their delivered physical mobility ever would justify, incl. all comfort and security aspects. Cars – no matter if formula 1, sports car, compact car, SUV or luxury sedan – are our own, very real form of impressive but useless „outside wall heaters“.

And what happens, facing day to day traffic jam, climate change and upcoming complete elimination of fossil fuels? Well, one thing happens. Of all factors, factor 5, the most unimportant one, is getting „optimized and fine tuned“: We see „direct injection gasoline combustion“, „hybrid motors“, „fuel cells“, „solar electric drives“ and much more. Well, they all increase efficiency. And they do it by 10% to 50%. But they leave the 1000% to 2500% improvement potential completely untouched! Potential that can be easily achieved by optimizing the first four factors: Projected area, aerodynamic drag, weight and rolling resistance. This is the frame of improving future mobility and may be the first time of really „inventing the automobile“.

We have to replace cars by a new, high-efficient generation of crafts. We have to replace them, no matter how influential car industry is, no matter how many car industry partners and suppliers are involved, no matter how many journalists or politicians tend to act car industry friendly and no matter how influential our own car-friendly mind-set might be. We have to, because anyhow nature's influence on all of us will be much bigger, if we don't.

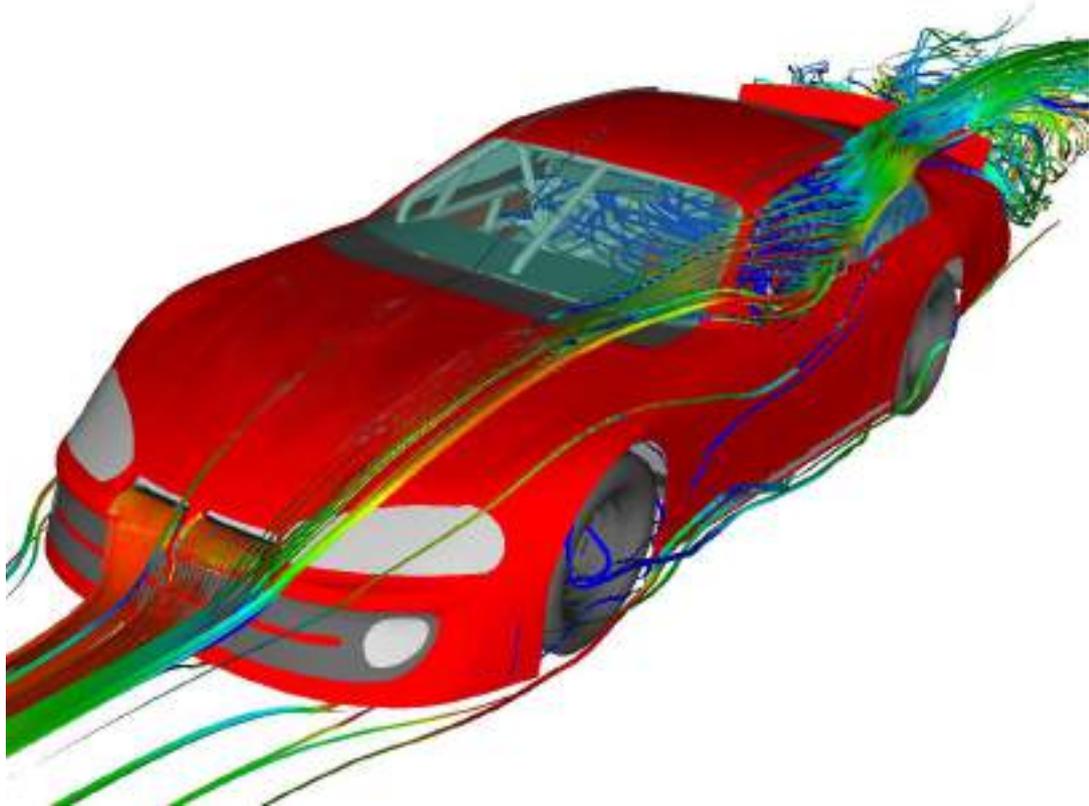


Fig. 9: Massive energy losses, caused by turbulent aerodynamics of todays cars<sup>4</sup>

**It has soundest reasons, why this proposal totally refuses to stick to the concept of our traditional cars.**

**Their mass and their aerodynamics, and hence their efficiency, is a true and monstrous disaster.**

<sup>4</sup> The airflow around cars is so horrific, that there are almost no pictures at all to be found in the entire Internet, showing it. Even though it is easy to show them these days. "Computational fluid dynamics "CFD" does it, showing us the flow lines, like at this rare picture that can be found at <http://legacy.ensight.com/news>



### 6.1.2 The irrational overemphasis of „the engine“

The story is not less interesting from a linguistic viewpoint. The common linguistic misconception of „having invented the automobil“ blocked the view on reality that just engine (= motor) was invented. The engine, the least important factor of automotive engineering, has 95% of „the automotive emphasis“. The projected area and the aerodynamic drag as the most important, are left with almost nothing. And indeed, the technical deformation is so massive that it even deforms the language: „Motor sport“, „General Motors“, „Ford Motor Company“, „Toyota Motors Corporation“, „Honda Motor“ or the „Bavarian Motor Works, BMW“ are just some of many examples..

The following chart clearly demonstrates the prevailing concept misconception by comparing number of Google hits of a car brand with either the term „projected area“ or the term „motor“:

<i>car brand</i>	<i>„projected area“ hits in combination with the given car brand</i>	<i>„motor“ hits in combination with the given car brand</i>	<i>quota in ppm (parts per million)</i>
<i>BMW</i>	203	3 170 000	64
<i>Chevrolet</i>	87	2 580 000	33
<i>Ferrari</i>	362	2 740 000	132
<i>Ford</i>	11 700	17 000 000	688
<i>Mercedes</i>	154	2 660 000	57
<i>Nissan</i>	613	2 610 000	234
<i>Porsche</i>	99	2 600 000	38
<i>Toyota</i>	375	2 800 000	133
<i>VW</i>	60	2 410 000	25

Chart 2: Google-hits about the emphasis of car brands and „projected area“ versus „motor“.

For example, the search term „BMW projected area“ generates 203 hits, while „BMW engine“ generates more than 3 million hits. The ratio between important and non-important factor has to be quantified in ppm, i.e. parts per million. The best ratio is with Ford, at 688 ppm or 0,068%.

Technically, the engine was invented and implemented into the carriage. Linguistically, the car was invented. Anyhow, even language itself proves that the „motor“ is in peoples´ heads whenever the car is mentioned. To prove this seemingly weird statement we checked how many hits in Google we get from „the car is“, „car the engine is“, „car the design is“, and so forth.

The next chart shows the outcome. Clearly, the statement „the engine is“ (or „the motor is“) is more often as the statement „the car is“. Even without declaring this Google-experiment as „a true scientific approach“, these results tells us something. It is shocking to see that the actually important mobility factors like weight, drag, aerodynamics or projected area:



- get anyhow substantially less hits than „the engine“ and on top of it
- they get the less hits, the more important they are:

<b>Search term</b>	<b>hits</b>
„the car is“ ...	2 000 000
„car“ and „motor“, e.g. „the motor is“, „the engine is“, „the power is“	2 628 000
car „the weight is“ ...	331 000
car „the drag is“ ...	14 800
car „the aerodynamics is“ ...	1 980
car „the projected area is“ ...	760
car „the carbon dioxide emission is“ ...	313

Chart 3: Google-hits about cars and related efficiency terms

This is why our proposal applies for a funding that does not only cover „some work on a new traffic system“ but that supports related research with competent companies and high school partners as well. The possible study fields might be e.g.:

- how linguistic terms and implied human paradigms block even urgently needed innovations or
- how psychological barriers, society patterns and emulation tendency hinder necessary perceptions.

There might be a high risk that e.g. architecture is trapped in archaic traditions similar to one with cars, too. Or that business life as such does not see huge organizational improvement opportunities because „we got used to something else“.

The Acabion is as different and as consequent as it is because we learned to take a birds eye view, look all around, and then focus again on what we learned up there. Therefore „Acabion related research“ has to be complex but still undeterred thanks to its birds eye view.

Nevertheless, a main target of the project is to bring the Acabion traffic system to a status of „ready for serial production“ in all three aspects: as vehicles, tracks and controlling. It has to be developed especially as an „innovation case study“ for other fields.

### 6.1.3 The option of new, objective parameters

If we say that there is an overemphasis on „the engine“ and that the much more important aerodynamics is left with almost no attention, there is a chance for new parameters correcting this deformation and making things simple and clear.



For example, one single parameter shall be defined that describes how good or how bad a car is. This figure should be an outcome of physics, so we name it „car<sub>E</sub>“, as the „conceptual efficiency“. The figure is defined as:  $\text{car}_E = 1000 / (\text{projected area} \cdot \text{drag coefficient} \cdot \text{total weight} \cdot \text{rolling resistance})$ . Calculated for a big SUV, we would get  $\text{car}_E = 1000 / (2,8 \text{ m}^2 \cdot 0,4 \cdot 2300 \text{ kg} \cdot 0,01) = 38,8$ . The „1000 / (...)“ makes the index bigger than 1, for placative reasons. A limousine would get  $\text{car}_E = 1000 / (2,2 \text{ m}^2 \cdot 0,3 \cdot 1400 \text{ kg} \cdot 0,01) = 108$ . Again it is very placative. What is less than 100 is worse than an average limousine. What is bigger 100 is better.

Decisive is the fact, that car<sub>E</sub> does NOT include the engine. An extremely aerodynamic and lightweight car could be powered by the drivers legs. This is a little bit exaggerated, but it shows how meaningless the engine is. As a matter of fact car<sub>E</sub> should NOT give the chance to car producers, to cover a „bad efficiency“ with a „strong engine“.

An innovative and efficiency-consequent concept like the Acabion would generate  $\text{car}_E = 1000 / (0,6 \text{ m}^2 \cdot 0,16 \cdot 350 \text{ kg} \cdot 0,01) = 2976$ . THIS makes very clear, what dimensions of improvement we are talking about.

Crucial is, that car<sub>E</sub> and all its parameters would be measured by neutral experts from outside car industry. Why? Because car industry deforms these data. For example, sports cars manufacturers measure the drag coefficient with spoilers in a retracted „low speed“ position. Low speed operation is irrelevant for the drag coefficient. It is like mentioning the temperature of an oven when its power supply is turned off. At high speeds the spoilers come up, make efficiency worse and no one knows how bad they get because the drag coefficient is hidden. Additionally, the „low speed drag coefficient“ is manipulated by using the slimmest tires (that nobody orders) or without rear windscreen wipers (everybody wants then). Same tricks are done with the projected area not including the mirrors, or the vehicle weight not including the additional sound systems, air-conditionings, etc. that the average car has.

For the engine, a separate efficiency index has to be established, like motor-efficiency  $M_E = X / (\text{carbon dioxide emission} \cdot \text{other pollution} \cdot \text{energy consumption})$  with X as a scaling factor bringing an average engine to a value of 100. Again, a value below 100 would mean a value worse than average, and a value above 100 a better one.

The overall efficiency of the vehicle „total<sub>E</sub>“ would then be  $\text{total}_E = \text{car}_E \cdot M_E$ . It is essential to multiply these values because they represent the system effectiveness.

Additionally there must be a figure to quantify how much work, material and resources like water and energy (overall, logistics included) was needed, and how much emissions were generated to produce the relevant car.

#### 6.1.4 Exemplary calculation of an innovative, climate protecting tax system

Just as an example, what could be done with a quality factor of cars, a new type of vehicle taxation shall be mentioned. The calculation could look as follows:

$$\text{Annual motor vehicle tax} = 100 \$ + (1\,000\,000 \$ / \text{car}_E)^{1,6}$$

The 1,6 in the exponent would ensure, that inefficient vehicles get over proportional higher tax rates, pushing these costs above a possible „snob effect“.



An average limousine would cause annual tax costs of

$$100 \$ + (1\ 000\ 000 \$ / (100 \cdot 100))^{1,6} = 1685 \$.$$

This is high, but anyhow justifiable, because today's limousines are not effective at all. A heavy SUV would cause motor vehicle tax costs of

$$100 \$ + (1\ 000\ 000 \$ / (38 \cdot 50))^{1,6} = 22\ 694 \$.$$

This reflects, how bad the efficiency of an SUV actually is.

An efficient innovation like the „road streamliner“ mentioned in this proposal, as a 160 mph vehicle, would cause a tax of

$$100 \$ + (1\ 000\ 000 \$ / (2976 \cdot 300)) = 101,19 \$$$

There would be a huge effect on the growth of the market for really efficient vehicles.

To avoid dividing by zero, for electric driven vehicles data of carbon dioxide and fine dust emission in the motor efficiency formula would have to be replaced by data representing emissions of the power production. This approach would underline another simple truth: That even electric power is not available with zero environmental impairment.

This chapter is just an example to show, what could be done with efficiency related parameters. To come up with tax models is not part of the project this proposal applies for. The scientific parameters however are a part of it, to create both consciousness that they are missing and preconditions for further steps.

### 6.1.5 Environmental aspects related to vehicles

Cars as we know them until the present day did not grow out of questions like „how can we protect nature“, „how can we save resources“ or „how can we keep biotopes untouched“. As an aside: A human residential estate is a biotope too. It is a biotope of human beings.

On the contrary they are characterized by a whole lot of environmentally unfriendly and damaging aspects: As emissions they generate carbon dioxide, carbon monoxide, hydrocarbons, nitrogen oxides, fine dust and noise. En route they constantly generate a risk of collisions with animals. German car industry names a certain part under the engine „bunny-plate“: It shall protect oil pan, steering and other parts when an animal is hit. Dazzling lights irritate animals and high vehicle masses, wide vehicle fronts and wide tires reducing the survival chances of each creature getting „in touch“ with a car even further. 20 billion accidents with animals bigger than a rabbit happen each year<sup>5</sup>.

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<sup>5</sup> Rough estimation based on European statistics, that on each killed human being in a traffic accident come 20 000 accidents with animals (like hedgehogs and bigger) being killed.



Additionally the production of cars consumes huge quantities of all kinds of resources like energy, different metals, fossil oil, fresh water and much more, all of it stressing nature even more.

On the positive side of the balance just single little reactions of car industry appear, representing a week alibi more than sound consequences. Two hands full of cocos fiber for insulation won't compensate, what one ton of uselessly „invested“ steel and plastic destroy.

### 6.1.6 The suppression of the most important facts

Since it is such an unbelievable trend going on, it shall be underlined, that car industry delivers the less aerodynamic data, the bigger the need for efficiency gets. There is almost no information any more in any car brochure – paper or Internet – about projected area and aerodynamic drag. The most important characteristics are kept secret, because they are getting worse, and not better.

To give just one of countless examples: The Porsche 356 Coupe of 1952, what is 55 years ago, had an aerodynamic drag coefficient of  $c_d=0.296$  and a projected area of  $A=1.677 \text{ m}^2$ . This multiplies to a  $c_d \cdot A = 0.496 \text{ m}^2$ . Compared to these data a 2007 Porsche Carrera GT has drag coefficient of  $c_d=0.396$  and a projected area of  $A=1.94 \text{ m}^2$ . This multiplies to a  $c_d \cdot A = 0.768 \text{ m}^2$ . This means, the aerodynamic efficiency of a Carrera GT of 2007 is just 65% of the efficiency of a Porsche 356, built 55 years ago. The trend is NEGATIVE ! The following chart shows these figures, plus a type 911 of 1990.

Porsche Model	Year	drag coefficient $c_d$	projected area A ( $\text{m}^2$ )	$c_d \cdot A$ ( $\text{m}^2$ )	Efficiency compared to Acabion road streamliner
356 Coupe	1952	0.296	1.677	0.496	10.0 %
911	1990	0.32	1.79	0.573	8.6 %
Carrera GT	2007	0.396	1.94	0.768	6.5 %

Chart 4: Major efficiency facts of cars. Example Porsche

In the last column we compare the achieved efficiency to the Acabion. It takes intensive research in the Internet, and the data are not provided by Porsche, but by people discussing vehicles (in)efficiencies in Internet-blogs. To make things even worse, two more things have to be considered:

- The weight of the Porsche 356 was 1411 lbs, what is less than half of the Carrera GT (3040 lbs), causing additional efficiency losses for the Carrera GT, and
- the spoiler of the GT will come up at high speeds, rising the drag coefficient to  $c_d=0.45$ , and hence reducing the indicated efficiency from 6.5 % to 5.2 %.

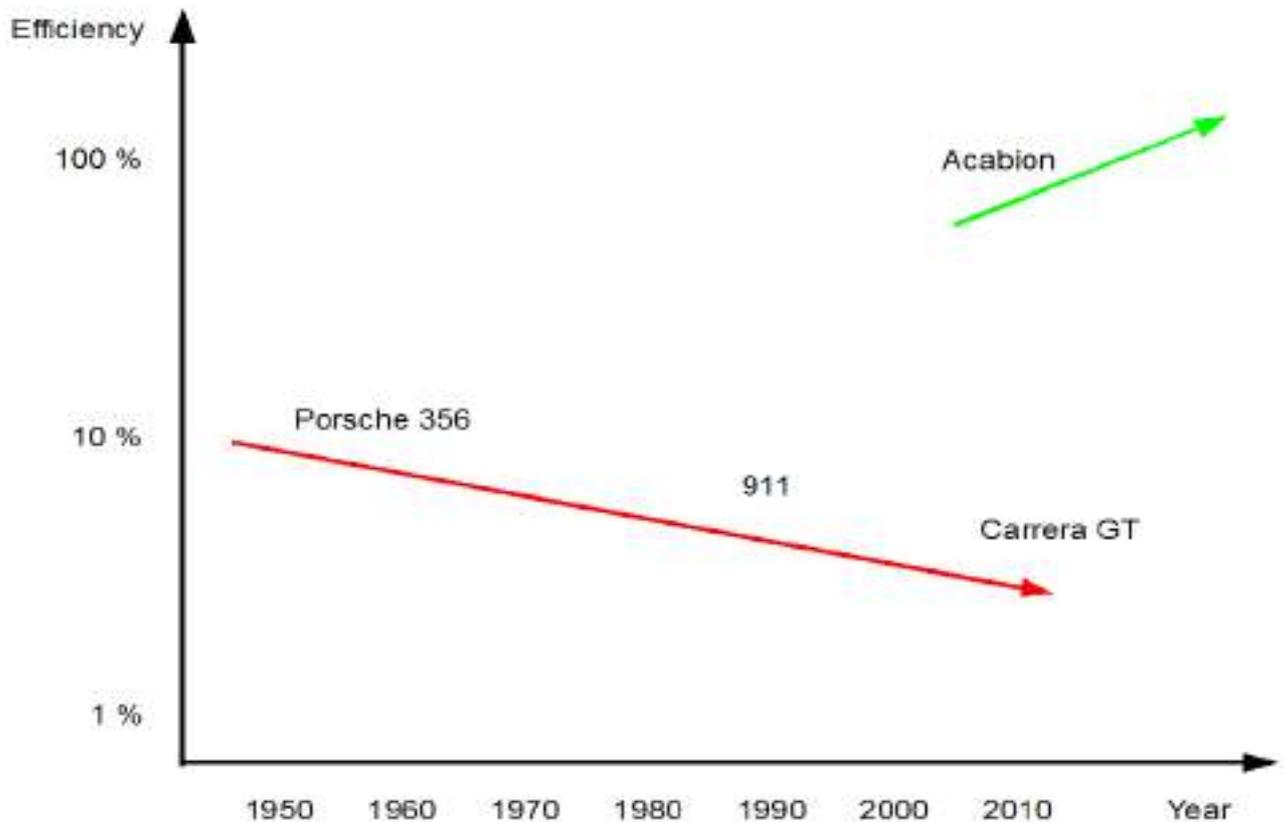


Chart 5: Basic efficiency of standard crafts. Trend, and comparison to the Acabion

As to be seen, the efficiency of standard crafts was so bad from the beginning, that it takes a logarithmic scale to show it.

Taking the vehicles weight into account, the 1952 Porsche 356 was twice as energy efficient as the Carrera GT of 2007. Anyhow it was 10 times inefficient compared to an Acabion.

The scenario is no Porsche-specific problem. It is an overall car industry problem. We just took Porsche as an example and finally we must state that over more than 5 decades, most of all cars did undergo a futile and just virtual “progress of optical design” and a massive and absolutely real, disastrous regression of their core efficiency. And instead of massive critics, most everybody is full of “enthusiasm for these fascinating dream cars”. This is an environmental PLUS a technological PLUS a mind-set disaster.

By the way: Security, comfort and other aspects of car's partial progresses do not at all make this situation better. They simply have nothing to do with that inefficiency-disaster, because they could have taken place easily in much more efficient concepts, too.

And now, please imagine how much the big and powerful lobby that came up with the “inventions” of cars like the “Carrera GT” will “like” Charts 4 and 5, and especially the innovators come up with it.



## 6.2 The horrific death toll: 3300 killed, EACH DAY

As the World Health Organization WHO reports, individual earthbound traffic as it is today has a death toll of 3300 human beings PER DAY or 1.2 Million per year. Men, women and children. An unbelievable tragedy with a still rising trend to a projected 2.5 Million a year from 2030 onwards. What we face daily today is the death rate of 9-11. What we will face until 2030 will be the death rate of world war one: 10 million being killed in 4 years. With the difference, that world war I ended after four years, and earthbound traffic won't.

We should never forget about people being killed uselessly in traffic accidents, just because mankind is failed in coming up with a more secure system. And we should never forget, that each killed victim stands for many who were injured and even more that lost so much, as the relatives and friends of the victims.

Whenever an airplane crashes, we have news all over the place for several days, about the "150 killed". These "150 killed" we have in road traffic every 65 minutes, day and night, Saturday and Sunday included as well as Christmas and New Year. People die at their birthday or the day they married. Children loose their father the day they were born and parents loose their children making that loss tare their life apart.

Here comes a message: We need a true innovation about facts-based reports. In each news, every full hour, there should be said how many people were killed since the last news one hour ago. "Since the last news 182 people were killed in traffic accidents. 85 of them were children."

## 6.3 STATUS QUO OF TRACK ENGINEERING

Roads are a direct advancement of the roman roads that made up the firs full-range long-distance road network centuries before Christ. The most famous one was the Via Appia, already connecting Rome with Brindisi 22 centuries ago. Like all roman roads, the Via Appia had almost everything, a modern road consists of: A broad trench filled in with sand and boulders, to form a solid foundation, a layer of compacted gravel and a robust surface layer followed, angled, to allow the water to drain off to the sides.

Since that time the Roads got wider and more smooth, but they anyhow stayed exactly the same. Just some partial aspects were redefined, like the asphalt surface or optical markings like the center strip. Any fundamental innovation of the system „road“ completely failed to appear within more than 2300 years<sup>6</sup>.

Never ever in more than 2300 years, the most basic „road question“ of all was asked and much less answered: „How should the „system road“ look like to be the most useful for its major task of providing smooth, efficient and secure mobility to earthbound crafts?

This again proves, how little a community is capable of true innovations. And this again is a physical disaster that caused huge global waste of resources over more than 22 centuries and that meanwhile became partially responsible for disasters like the global warming.

What happened was that the old „Via Appia“ concept was just transferred to a mass-traffic- and high speed network. „High speed“ related to those pedestrians or horse-

<sup>6</sup> The first parts of the Via Appia were built 2312 BC under Claudius



drawn carriages that once traveled the Via Appia. Roads this way was transferred into a type of use the Via Appia was never designed for. The next chapter offers a closer look at what this meant for the physics of roads:

### 6.3.1 Efficiency aspects of the road

Since the vehicles got wide and heavy, and since the traffic volume grew to mass mobility, the roads adapted and got many lanes, hence they got wide and heavy, too, and even the most expansive infrastructural elements like bridges and tunnels have to be dimensioned accordingly. High traffic density and cars big masses determine a lot of noise. From 40 mph onwards the tires generate more noise than the engines. Hence additional noise barriers have to be installed, pushing the already immense costs for road construction to almost unbearable amounts. A separation of passenger- and cargo traffic, highly to be recommended in terms of safety as well as of speed, founders off way too high costs.

The huge costs and the high demand of space in many cases make new direct connections as impossible as increasing average speeds. To cover a linear distance of 100 miles, in a rough average we have to drive 150 miles today, causing additional 50% waste and losses. The Via Appia connected the linear distance Rome Brindisi of 296 miles within 336 road miles, what makes a loss of 13%. This is better distance-effectiveness than most highway-connections offer, today.

Not necessary to mention that today all related costs of road infrastructure like frequently necessary maintenance or repairs are enormous, too.

### 6.3.2 Environmental aspects of the roads

In case a community wants to build a new road, usually a long discussion takes place, how the pathway of that new road should look like, not to disturb certain biotopes more than necessary. These discussion – showing some kind of responsibility towards nature – are no contradiction to the statement, that roads are death zones and that, as a traffic system elements, they came up without any concerns about environmental aspects. A three lane highway makes a 45 m wide death strip, and if there is „responsible discussion“ where to place it, it anyhow stays a discussed, „where to place a death strip“. What would be necessary is to discuss, how a traffic track should look like, that would be no death strip any more. This is a huge difference.

### 6.3.3 Further system elements

As further elements bridges, tunnels, parking spaces, garages or junctions shall be mentioned. They all adapt to the huge sizes of passenger vehicles, and they all get much more expansive than the mere function of a secure, fast and comfortable transport would demand it.



Maintenance and repairs get more expansive, too. And so, in the end, building and using huge passenger cars is not only a matter of marketing or „we like them so much“. They determine

- Global warming
- Futile waste of resources
- Wide, material consuming and hence expansive roads
- Expansive bridges and tunnels
- Complicated procedures to build new tracks
- High costs for maintenance and repairs
- High costs for intersections, parking places or other traffic elements
- In the end they determine such a high cost level, that no one will even think about separating cargo and passenger tracks, what security-wise would be the key precondition for zero accident traffic

#### 6.3.4 Why new and own tracks? Comparison with the Shinkansen track system

Because traffic death toll is so painful, a comparison with the most secure traffic system in the world shall be given.

The Shinkansen is a network of high-speed railway lines in Japan operated by Japan Railways. Since the initial Tokaido Shinkansen opened in 1964, the network has expanded to link most major cities on the islands of Honshu and Kyushu with running speeds of up to 300 km/h (186 mph), in an earthquake and typhoon prone environment. Test run speeds have been 443 km/h (275 mph) for conventional rail, and up to 580 km/h (360 mph) for maglev train sets.

Shinkansen literally means "New Trunk Line" (New = Shin, Trunk = Kan, Line = Sen) and hence strictly speaking refers only to the tracks. Shinkansen are standard gauge, and use tunnels and viaducts to go through and over obstacles, rather than around them.

Shinkansen track is standard gauge, extremely level, and has rails that are continuously welded together to reduce vibration. Japan was the first country to build dedicated railway lines for high speed travel.

The Tokaido Shinkansen opened on October 1, 1964, just in time for the Tokyo Olympics. It was an immediate success, reaching the 100 million passenger mark in less than three years on July 13, 1967 and one billion passengers in 1976. Sixteen-car trains were introduced for Expo '70 in Osaka.

This early success prompted an extension of the first line westward to Hiroshima and Fukuoka (the Sanyo Shinkansen), which was completed in 1975.

In 2003, JR Central reported that the Shinkansen's average arrival time was within 0.1 minutes or 6 seconds of the scheduled time. This includes all natural and human accidents and errors and is calculated from all of about 160,000 trips Shinkansen made. The previous record was from 1997 and was 0.3 minutes or 18 seconds. Japan celebrated 40 years of high speed rail in 2004, with the Tokaido Shinkansen line alone having carried 4.16 billion passengers. According to Japanrail.com, the total network has carried over 6 billion passengers.



There have been no passenger fatalities due to derailments or collisions during operation of the Shinkansen.



Fig. 10. The Japanese Shinkansen on its separated track, next to Mt. Fuji

So there are some crucial things about the Shinkanzen. Things that are of importance for all kinds of traffic systems.

No.1: There is the saying that “to err is human”. And like all sayings it is not just a saying: It influences peoples real life. And especially “to err is human” does a terrible thing: It makes one walk straight into a paradigm trap where one closes his eyes, becomes passive and thinks: “Systems that are defect free or that are 100% safe just can not be created. It can’t, because to err is human. And hence if it would be a 100% safe system it would be inhuman”. And as if it would be necessary to amplify this failure of understanding, people see the very few who say “yes, we can make 100% safe systems” as

7 Now some people will tend to make a big deal out of discussion if 100% is possible or just 99.999...9%. They are right. It is clear that it never will be 100%. But it is essential to see that 99.999 999 99 is possible (Shinkanzen) and that 99.999 999 99 is better than 99.999 9 (road traffic).



fools, as some kind of idiots who do not share that “universal and eternal wisdom” of “to err is human”. Truth is that “to err is human” is incomplete. Human beings err if they assume that “to err is human” means that defect free systems can not be established. It is possible. And those systems are the most human systems of all, because they do not hurt anybody. The Shinkansen proved that in an almost unbelievable extent. It would be everything but wise not to learn from that marvellous system.

No. 2: The Shinkansen has defined characteristics that make it as safe as it is. E.g. a track totally separated from any other traffic track like commuter trains or cargo. The Shinkansen is designed from the beginning and through and through until today, to be as safe as it is. The key principle in Japanese is called “Poka Yoke”. What means to make a system safe even though people err sometimes. This is the absolutely essential thing: A system can be designed in a way that human errors do not cause trouble. A simple but effective well-known example is that one can not put an electric jack in a socket in “a wrong way”. One can put it in or not, but it is not possible to put it in “the wrong way round”. This kind of a smart preventive system is used in biochemistry since millions of years. No human being, no life at all would exist if cell physiology would not make an intense use out of this principle that is called “key lock principle”.

The core message is simple: Who wants zero accidents in passenger traffic, has to create separate tracks for one system only, and he additionally has to create it strictly and to a 100% according fail safe principles.

### 6.3.5 Prospect to a future track system

An efficient, comfortable and secure traffic system has to be elevated, mostly dead straight, relatively lightweight and slim, and hence cheap. It has to be flexible, so that it even could be disassembled in case new tracks or new infrastructural situations make an elder track useless.

A Japanese sumo fighter, the biggest world class wrestler, a „mister universe“ in body building or the strongest man on earth marks the widest possible human being. This width, plus 6 inches for the necessary vehicle body structure, is the width of the passenger transportation system of the future. The future system width hence is 3.2 feet.

## 6.4 Overall view at individual mobility today

Since Via Appia and the horse drawn carriage, the complete system crafts, tracks and controlling systems was called in question sometimes, but never with a result of starting a serious overall redesign process. However, such a serious redesign is overdue for several reasons:

- As mentioned before, the average speeds, streets and crafts were invented for, changed into a region, that make the patterns of both obsolete .
- The average traffic volume grew from may be one horse drawn carriage every 15 minutes to one „car“ each 0.5 seconds.



- On the other hand, the state of the art of all kinds of technologies reached new dimensions. Dimensions unimaginable by the pioneers, who once created the overall system we still use.
- And new fields of technology appeared, not even been dreamt of by the „pattern-making“ pioneers of tracks and crafts: Microelectronics, mechatronics, bionics or high-performance mathematic / computer modeling to name just some of them.

A sustainable, integrated, networked and target oriented innovation of individual national and global continental traffic is completely overdue. Sustainable in terms of natural resources as well as security as well as comfort as well as mobile potential.

The target of at least 5 times less use of resources and at the same time at least 5 times more mobility in terms of both speed and volume will same time mark the precondition to switch traffic to solar power supply.

As will be shown, all technologies to make it happen, are already there. What is missing is just one thing: The cognition of the general fault and the will and commitment of a first influential group to make fundamental innovations happen.

Maybe the cognition of this widespread deficit is so difficult, because all other earth-bound traffic- and logistic systems are stuck in meanwhile useless traditions too: Buses, trains and trucks are as obsolete as cars. The consequence: We see obsolete earth-bound traffic ONLY. Hence, seeing cars does not give us any impression like „this system is overdue“. There is nothing new around, that we could compare it too, and that would make things clear.

## 6.5 The “CEO to Le Mans epiphany”

How does a German automotive CEO get to Le Mans for the car race? Well, he has not so much time. To cover the 530 miles he takes the private jet.

Now THIS is an epiphany. These leaders sell car-technology as “fast and comfortable”, and anyhow refuse it by themselves. Why? Because it does not work. It is stuck in traffic jams, stress and not existing predictability of travel times. E.g. Munich Le Mans on the road is 640 miles. Travel time in a private jet, door to door, is 4 hours. Travel time in a “super sports car“ (stuck in the next traffic jam anyhow) is 8 hours at least. Speed limit in France is 80 mph. As we will see, travel time with the depicted true innovation of mobility will be 2 hours door to door, automated and solar electric. Half the time of the jet.

The private jet will generate 9 pounds of carbon dioxide per mile or 5 760 pounds in total or 11 520 pounds for both directions. This is about 12 times of what the sports car would take, that is a disaster already. This behavior shows, how these leaders are “functioning”, and it shows that it will take a true innovation in leaders behavior, too. Explicitly it shall be stated, that the problem is not flying with a private jet. The problem is that automotive leaders stand for automobiles, that are not working any more.

It is like bakers with the responsibility to bake bread for their village and who can not do it. They bake salt stones no one can eat, but since everyone needs salt they “stones” are sold anyhow, and they are expensive. Hence the bakers have money anyhow, and no problem: They eat Sushi or Caviar. Again: The Susi or Caviar is not the problem. The problem is that the people have no bread.





**"If the facts don't fit the theory, change the facts."**

**Albert Einstein**





## 7 TRUE INNOVATION OF ROAD TRAFFIC

The Acabion-traffic system takes up the challenge to reinvent it all

- passenger road-crafts, taking all efficiency parameters into account
- specialized highly efficient tracks for these new crafts only
- and sophisticated controlling systems for fully automated driving

To make it all implementable, the new crafts will be able to drive on any existing standard street, from cart roads to highways.

### 7.1 THE BACKGROUND OF THE SUSTAINABLE ACABION APPROACH

Besides building highly efficient and fundamentally innovative highspeed vehicles, our Acabion dream and vision is simple: Stop global warming and provide good living conditions and a good infrastructure for each single soul on this planet. Like nice flats, schools, hospitals, solar power plants, workplaces and recreational areas. To achieve it, we are convinced a brandnew global traffic system has to be established. E.g. Africa most likely won't ever have a highway network. But it can have an outstanding new, fast and solar electric driven individual traffic system instead, new and fundamentally innovative tracks included, that are cheap, but anyhow marvelous in their bionic appearance and all their amazing potentials. And here we've come full circle: High performance traffic systems and capable preconditions for infrastructural improvements are the same.

### 7.2 A fine new world of global mobility

A fine new world of new and massively enhanced mobility "for everybody and everything" will have the chance to generate more infrastructure - like schools, solar power plants and modern hospitals - than any program ever did before. Last but not least it will support economical independence, personal satisfaction, political stability and peace. THIS is the core of our vision. Vehicles are no self purpose. They never were and never will be. What counts is what they can do for people AND for nature. And the more they can do in this sense, the more acceptable and the more fascinating they are.

The Acabion GTBO is the technology carrier for that new mobility concept for all continents. We want the best technology for everybody. To get it, we design the top model first, so that all future versions can learn the most of it. Next step will be fully electric bionic streamliners. All Acabion vehicles, GTBO as well as future electric versions, are capable to use both all existing roads and new, extremely cheap, but anyhow marvelous innovative future high-speed-tracks, like Africa will have them.



Just as a side-effect the Acabion traffic system is better than cars and highways in high developed countries, too. It is at tenfold better and hence it is a true innovation for all continents.



### 7.3 TRUE INNOVATION OF PASSENGER CRAFTS

The Acabion-vehicle genesis took place within more than twenty years, starting in 1986. Three generations of vehicles were built, constantly learning and improving. The first vehicle shown to the public was the generation III Acabion GTBO, presented at the Geneva motor show in 2006.



Fig 11: Passenger craft Acabion GTBO

Since June 2007 generation IV is on its way, improving aerodynamics further more, offering full convertible capabilities, reducing noise, enhancing both active and passive security, and growing to a length of 16.27 feet or 4.96 m. In its new interpretation of individual mobility, the Acabion bionic craft has to be explained.

#### 7.3.1 The body

The Body is a lightweight carbon fiber monocoque, like formula 1 race cars have them. Hence it will be enormously secure.

To obtain a small projected area, the seats are positioned behind each other. Just this one fact saves at least 50% energy and reduces carbon dioxide emissions by a factor



two. Hence it is not a matter of discussion in a way „I like or I do not like seats behind each other“. It is a matter of at least 50% efficiency, and hence the choice is made for “behind each other” before we even have to discuss it.



Fig. 12: Acabion GTBO test drive at Samedan / St. Moritz airport,  
Side-wheel tests at 50...70 mph

### 7.3.2 The chassis

The Acabion Chassis will be a specially designed ultra compact but anyhow sophisticated front axis plus a rear axis basically originating from super sports bikes. The chassis is a lightweight aluminum construction with further weight-reduction options for the future. The mechanical stability will be provided by either carbon composite structures or aluminum or steel alloy. It will depend on the price range of the streamliner category. The most expensive ones, like the GTBO, will be built and manufactured like a formula 1 race car.

#### 7.3.2.1 Two plus two wheel concept

As mentioned in the preliminary remarks, the concept comes as a two wheel with mechatronic balance actuators, and it two retractable side gears for parking position and special low speed operations to be described in the next chapter. As – due to efficiency



reasons – there is no sincere question if people driving in a car should sit next to each other or behind each other, there is no sincere question, too, if a future earthbound craft should have two or four wheels: It will have two. The reason is in what Leonardo da Vinci meant when he said "*Simplicity is the ultimate sophistication*". In particular it will have two, because

1. this saves two rims,
2. it saves two tires,
3. it saves two brakes,
4. it saves two wheel suspensions,
5. it saves two wheel bearings,
6. it saves half of the steering system,
7. it saves two wheelhouses and
8. in terms of aerodynamic efficiency it saves 50% of the wheels projected area.
9. All of this saves valuable resources like material and energy during the production process and later it saves weight and additional energy resources whenever the craft is driving. Hence it saves energy.



Fig. 13: Acabion GTBO test drive at Samedan / St. Moritz airport,  
Side-wheel tests at 50...70 mph

The mechatronic balance system can be smaller and more compact than all of the mentioned components under 1. to 8. in the previous list. It is thought about a balance actuator behind the copilot's seat: An electric driven pendulum can stabilize the Acabion in an



always balanced and steady position. But actually there is not even a need of a separate balance system, because a two wheel craft like the Acabion by itself already makes a complete balance system:

While driving an Acabion, the “pilot” either operates it manually on standard roads (today) or the craft operates autonomously while driving on an automated track (in the future). In both cases, the steering itself is “the mechatronic balance system”. In both cases the steering is not directly linked to the steering-handlebars of the cockpit, a situation comparable to the tried and trusted control of modern aircrafts. The Acabion steering linkage is indirect in a way that either the driver (manual mode) or the track controlling system (automatic mode) just gives the input into the steering mechatronics, telling “where to go”. To actually steer the front wheel and make the Acabion go exactly where it should, the mechatronic steering system will have computers programmed with “all the steering and balancing motor function abilities of world champions in motorcycle trials and in artistic cycling”. E.g. coming to a standstill at a stoplight on a manually driven road, the driver still “steers” the Acabion straight forward. In the moment when standstill is achieved, the front wheel automatically turns to a maximum left position. This will be imperceptible for the driver. He will not see and he will not notice it. He will just notice the effect, that the craft will remain balanced at all times. How does that happen? Well, it happens like Leonardo da Vinci would have designed it. Simple, and most sophisticated: If the craft e.g. tends to slant to the left, the steering mechatronic will hold the front wheel in the maximum left position and will just send a fine tuned immediate signal to the crafts electric drive, to move a bit forward. This tiny maneuver will slant the craft upright again into a balanced position. And if a bit later the craft would tend to slant to the right, again the front wheel will stay in maximum left position and the steering mechatronics will send a fine tuned immediate signal to the electric drive to move the craft a little bit backwards. This will slant the craft to the left again, with the same effect of restoring a steady position. The kinematics and the motor function abilities refer exactly to what artistic cyclists do. They will never put their feet on the ground if they do not want to, and they handle a sturdy standstill exactly as described, just with the brain being “the controller” and the legs muscles being “the drive”.

As a first summary we can say about a two wheel concept, that – according to Leonardo da Vinci's major principle – it is of a sophisticated simplicity PLUS it already comes with all the all the preconditions needed to be a sturdy and absolutely reliable craft under all circumstances. To complete the sophistication of a two wheel craft it comes with at least four more massive advantages towards a four wheel concept:

1. A two wheel craft can be really slim, what determines a huge advantage in terms of efficiency, and it can anyhow be very dynamic in curves. It can even be pushed hardly through turns of a racetrack just like a super bike. This means being all at the same time, A) sophisticated in da Vinci's sense, B) slim and hence super efficient and C) able to race through curves. Such a combination of characteristics could never be achieved by traditional four wheel concepts. As soon as a four wheel craft is made slim, it will immediately get unstable in curves, tending to spin over.



2. An enclosed two wheel craft offers tremendously more comfort to its passengers than a four wheel craft: a) It leans in curves and hence completely eliminates any sideways forces affecting the passengers bodies and b) the craft will eliminate all irregularities that any road might show crosswise to the direction of travel. This is striking, but true: A four wheel always will transfer any crosswise irregularity any road has to its drivers, shaking them sideways in their seats. May be drivers got so used to that, that they do not notice it any more. But one thing is for sure: They will delightedly notice that it was eliminated, as soon as the get used to sophisticated two wheel crafts.
3. Since the craft's track width is massively reduced, the track itself can be slim, too. It can be decreased from the width of a road lane to just about 4 inches. This is a *“crazy and totally insane”* scenario again: *“A two wheel craft driving on a 4 inches wide track? Crazy! Absolutely crazy!”* Well, to make this *“horror scenario”* complete, we even say: *“And the 4 inches track will be elevated to something between 25 and 45 feet above the ground, and crossing deep valleys or big rivers the elevation can even rise to several 100 feet”*.

Now, before anyone throws this proposal into the chimney fire, please let us think about it: a) Would not such a narrow track have the advantage of very very little own weight, little material requirements and hence little costs? b) If the leaser head of a DVD drive follows a track of 0.0000001 inches, could not a craft, equipped with same kind of electronics, sensors and actuators follow a track of let's say 0.1 inch? c) Remembering Leonardo da Vinci (simple is sophisticated) – if the “earth contact line” of a craft is just two inches wide, why at all should the track be wider than four?

As we see, the only need for a wider track would come from weak abilities of the craft in steering and balancing. Now one thing is for sure: We do not have to start the new traffic system with a 4 inch beam up in the air. We can start it as a 9 feet lane with a lot of security in it. Anyhow it is important to know what the vector of development will be over the next decades.

Our grand grand children one day will have reduced the track width of their elevated modern high speed long distance freeways to something like 4 inches. And the crafts will balance aerodynamically plus in many ways we do not know yet. THAT is innovation: Things coming up nobody knows yet. Saying “there will be no things we can not imagine” is saying “there will be no innovations”. But to stop global warming, there have to be a lot of innovations. That is why these things are discussed so explicitly here.

One more thing: The Acabion would not only be able to balance within 4 inches. It MUST be able to balance within even one. Why? Because even on a 9 feet track we want it to be absolutely sturdy in its ability to follow its perfect center path. We want it for security reasons. It is anyhow all just a matter of target setting. It is like Larry Page and Sergej Brin defined it for Google so smart when they said: *“One must have a healthy disregard for the impossible”*.

4. A two wheel craft – with its tires rounded cross section – is much less sensitive towards aquaplaning than a four wheel craft. There is no aquaplaning for a 400



lbs motorbike, and hence there is no aquaplaning at all for a 700 lbs streamliner on super-bike tires.

Talking about sturdy two wheel crafts, all the preconditions to make it happen are already there: In a time where airplanes fly by themselves and robots play soccer, it will be easy to create a “driving robot” as described. May be this picture is the best one: To think about future crafts as “two wheel driving robots”.

### 7.3.2.2 Retractable mechatronic side gear system

To ensure stability while the craft is shut down in a parking position, there is a hydraulic gear system, lowering two side gears – applied with two smaller wheels – for parking position. On standard roads this side gear system will also be capable of staying in road contact up to speeds of 100 mph. In cases of snow, mud or autumn leaves on the roads surface this will offer a lot of additional stability.

This side gear system is a mechatronic system, too: A) In Parking position it holds the craft upright, no matter what shape or slope there is in the parking lot. B) while driving in “stabilized mode” with gears down, the craft anyhow will naturally lean in curves. The side wheels will just gently touch the ground and will only generate forces, in case of the craft getting into a slide. In that case the side gears will immediately stabilize the craft and then bring it to an upright position again.

### 7.3.2.3 Optional side gear drive

To complete the picture, the side gear wheel can get an additional drive system. E.g. hydraulic or electric driven rough terrain wheels at the side gears would make the two-plus-two-wheel-craft an off-road vehicle.

By the way this is a bionic approach again: A bird has two wings for high speed operations and two legs and feet for low speed. And the capabilities of the feet can and have to be totally different than the capabilities of the wings. Anyhow in severe conditions, they act together, e.g. using “the feet” as aerodynamic breaks.

## 7.3.3 The engine

To guarantee a good acceleration, the average 21<sup>st</sup> century mass production streamliner craft should come with at least 75 KW.

### 7.3.3.1 Combustion engine versions

The overall efficiency of the Acabion as the 21<sup>st</sup> century road streamliner is that high, that even a combustion engine can be used. Even though it is not absolutely consequent, some sportive versions of the Acabion can come with a small turbo gasoline engine for the next one or two decades. May be combustion engines will completely disappear as soon as 500 KW electric versions reach the same fascination as 500 KW combustion turbos have it now.



### 7.3.3.2 Hybrid engine versions

According to the enormous efficiency of the Acabion concept, a direct step from combustion engines to pure electric engines seems to be logic. Hence there is no reason to establish a hybrid drive. Anyhow a hybrid system is a severe conflict towards Leonardo da Vinci's "simplicity is the ultimate sophistication" statement.

### 7.3.3.3 Pure electric versions

The motor of the pure electric versions will be equipped with all high tech details it needs to make it a lightweight and high potential, sturdy machine. Electric Streamliner versions will have an accumulator to store electric energy. The accumulators, as well as the entire craft, have to be designed towards overall balance aspects.

### 7.3.4 Strategic differences to other 21<sup>st</sup> century high-tech projects

It is very important to say, that there are huge differences not only between traditional cars and the Acabion, but there are huge differences between other future oriented projects and the Acabion, too.

#### 7.3.4.1 Differences towards enclosed two wheel scooters or motorbikes

Compared to some – anyhow rare – partially or fully enclosed scooters or motorbikes the differences are enormous: An enclosed scooter or motorbike goes along a genesis path

1. Take an existing scooter or bike,
2. stretch it,
3. put one or two seats in between,
4. build a body around and
5. make sure the craft length stays under 13 feet, not to get in conflict with scooter or motorbike road certification regulations and

The Acabion genesis is totally different:

1. Build a cockpit section in perfect aerodynamic shape, very close to the contour of a world class glider airplane or a trainer jet,
2. integrate two shell seats in an ergonomically perfect shape and positioning,
3. design a totally new front axis and steering to be implemented in the ultra-compact vehicle nose,
4. take the rear axis and suspension of a super sports bike,
5. make sure the craft is long enough for perfect aerodynamics, and do not care about old fashioned certification procedures. When it comes to true innovations, the technologies mint the certification, not certification mints the technologies. And
6. adapt all components like gearbox, light system, rear view system etc. to the overall efficiency of the new concept.



### 7.3.4.2 Differences towards three wheel concepts

A three wheel is a strange thing, because it creates a projected area with even more wheels in the wind than a four wheel: A four wheel has both left wheels behind each other and both right wheels. Hence the projected area “sees” just two wheels. The three wheel creates a projected area with a left wheel, a right wheel and a center wheel.

Creating more simplicity than a four wheel, a three wheel somehow appears as a step into the right direction, but taking effects like the mentioned projected areas into account, it is a step backward same time.

There are no “three leg concept” in nature. Latest at this point an engineer with a bionic oriented and a consequent and efficiency-oriented mind set will draw decisive conclusions.

Talking about high speed sturdiness, a three wheel will unfold severe risks. There is no three wheel on the market topping 130 mph. For very good reasons. For low speed operations like maximum 20 mph there are three wheel with quite good aerodynamic shape. But they are a very specialized low speed solution, only, being far away from any practical application.

### 7.3.4.3 standard four wheel cars with hybrid or electric drive

Each hybrid or pure electric car

- with a weight of something like 2000 or more lbs,
- with four wheels,
- with a projected area like usual cars and
- without a bionic streamlined form

stays an old concept. It stays a path labeled as “innovation”. But it is no true innovation, even if its batteries are lithium ion technology. What counts for a true innovation is the innovative overall concept, and not the innovation just of certain elements, leaving major efficiency disadvantages in place.

### 7.3.5 The role of a new guiding star

Whenever a new traditional four-wheel sports car or super sports car is presented, we know what happens: The press takes it for a test ride, and we know, what they will write about it. *“That it is fascinating, even though no one needs it. And that it consumes a lot of fuel and generates a lot of carbon dioxide. But this is no problem, because there will just be very few of them sold.”* This is the “standard procedure”. We can find that hundreds of times, almost without any exception. *“These fascinating super sports cars waste resources. O.k., but let them. It doesn’t count because they will be very rare.”*

Well, that is nonsense. It is complete nonsense. It does count, and it counts a lot. It counts, because those “rare” monsters define nothing less but the guiding stars of an entire world. They define what young boys around the globe dream of. And they will dream of them their entire lives. And those boys will grow up and try to get one of these monsters. And if they can not get it, they at least will try to get close to that “idol”. Wide



should it be, their car, and it should have those “fancy wide wheels” and those “spoilers” and four exhaust pipes and it should be heavy and impressive. And they will decide this way. They do. They do it since decades! They decide to buy “big, wide, heavy and impressive” cars. Triggered by nothing else but the wrong guiding stars.

To tell “*super sports cars are rare, and hence they do not have negative effects*” basically is like telling “*the orientation of a gun barrel has nothing to do with the effect of that weapon.*” Everyone knows this is wrong. And to make things worse, it does not only happen with super sports cars, it happens with limousines, vans, pickup trucks and SUVs. too: The “top of the line” versions always are the huge ones, the heavy ones, the wide ones and hence the ineffective and wasteful ones. And in each category, the argument comes, that these so called “top-models” “*don't harm, because they are rare*”.

Nonsense. They harm! Because they all count, and the more rare and “exclusive” they are, the more they count. Hence we have just one chance to overcome that: To provide a different idol of individual mobility to everybody, especially to our children. Different in a way that it is no longer an energy wasting race- or sports-car monster, but that it is “shining bright from the efficiency quadrant”. And to become an idol, it must be faster and more potential, than these “fat monsters” ever were.



Fig. 14: Acabion. The new 300 mph guiding star for earthbound traffic



To provide that idol, Acabion defines the new guiding star: The 750 hp 700 lbs GTBO. Performance: 100 mph in first gear. 260 mph at 12 % throttle and still with two more gears and 650 more hp “on standby”. 0 to 300 mph in less than 30 seconds. And most of all: From 100 mph onwards ten times less fuel consumption, than a “super sports car”. These are the facts and figures of the 21<sup>st</sup> Century.

A maximum of 26 GTBO units will be produced in total within the next 5 years. It is one of the most exclusive innovations you can buy. And it sure is one of the fastest. Each vehicle will be absolutely unique. Time to build one GTBO is three years. Material and production technology of an Acabion is pure and original Formula 1 composite, as carbon and Aramid fiber honeycomb, plus jet fighter technology with composite and titanium alloy key components. Prices start at 1.8 Million €.

It shall become the new mobility dream for human beings aged 1 to 100. And it will place the new guiding star in the efficiency quadrant, where it belongs and the only place from where it can really guide a process to stop global warming.

It defines a new kind of efficient dynamics: Key facts of the Acabion GTBO 2008: More than 2100 hp per tonne. 100 mph h in first gear. 0 to 300 mph in less than 25 seconds. From 180 to 240 mph in half a quarter mile. Above 90 mph three times less fuel consumption than a Smart. Above 150 mph seven to ten times more economical than a super sports car, and at 250 mph still two more gears, and 650 hp still on standby.

Anyway we look at it, there is an important dual function in the strategy of this “guiding-star-approach”:

1. The Acabion GTBO will provide a new image to the minds and the mind sets of ourselves, our children and grandchildren. The image, that environmental friendly technologies still can be tremendously fascinating. Actually they can be more fascinating than a “warming-the-globe super sports car” ever was.
2. There will be 75 KW electrical operated versions for mass mobility soon. And they will get both the advantage of the superb image of the GTBO plus all the technological experiences the GTBO generated within 20 years. And there are a lot of experiences, especially because it must handle a 750 hp turbo in a 700 lbs system. That is jet fighter potential in an earthbound craft.

### 7.3.6 The function of a the new guiding star

The “guiding star” Acabion GTBO was first time presented to the public in Geneva motor show 2006. And its function as guiding star is working. Some e-mails feedbacks we got:

*“...This is exactly what I have been looking for.”*

*S. Martinez, USA*

*“...Wow!!!! ...really a beautiful machine!! I really need to compliment you on a unique design and interesting lines.”*

*W.A., Pilot from South Africa*



Fig. 15: The GTBO as identification object and the “new great dream” of generations to come

*„....The admirable concept is such a refreshing contrast to other automobiles that I am sure you will win a lot of praise with it within the coming years.“*

*M.G., Germany*

*“I was really amazed to see how far technology has got to. Great products!”*

*J.Q. Saudi Arabia*

*“...a wonderful creation.“*

*J.S. USA*

*“I must say I find your concepts for the future of travel quite remarkable. ... Thanks for designing such a beautiful craft.“*

*T.W. USA*

*“Wow, what a vehicle!”*

*J.H. Arizona, USA*

*“A super-ultra car.”*

*T.S. Tokyo, Japan*



*„With ardor I visited your site ...“*

*H.J. Schwitzerland*

*“Chinese children are very interested in the Acabion. It is perfect! Please help us, and let more Chinese children know the perfect Acabion.“*

*J.L. , Journalist from China*

*„...I want to congratulate you for such an ambitious project into practice.I must admit that I really like it ...!“*

*R.P. , Austria*

*"...your concept of this machine is equal to Henry Fords Model T and MR. Porsches Vw Beatle . ...“*

*G.B., USA*

Since Geneva we had the Acabion GTBO at different locations for both planned and spontaneous exhibitions. Wherever we locate it, it is surrounded immediately.

The fascination is, that it thrills everybody: Young and old, male and female, car enthusiasts and people usually being not interested in technology.

One day we presented the Acabion at the hangars of Samedan Airport. It was standing among other cars, some classic cars and a formula 1 race car that won the world champion chip not long ago. We observed especially the children: They all ran for the formula 1 first, and came back with big eyes “that was the world champion formula 1. Wow!” After that they looked around and some started coming towards us, a little hesitant first. We briefly described what the Acabion is, that it is for two people, has a 750 hp turbo and that it is very, very fast. Much faster than a formula 1 racecar. And most of all, very efficient.

It took another 30 minutes and children from all over the place started coming to us, asking “is that true what we heard? It as faster than a formula 1 and needs less fuel than a compact car?” And we said: Yes, it is true. It is, because the Acabion learns from nature. It is shaped like a dolphin. And that makes it very, very efficient”.

We had even a 7 year old girl standing at our side and observing the Acabion, and her mother said *“I just cab't believe that, she usually was never interested in any car or motorbike. This is the first time in her life that a car gets her attention.”*



## 7.4 TRUE INNOVATION OF TRACKS

The Acabion streamliners can use all actual road systems. Anyhow the Acabion traffic concept comes with enhanced future aspects: Elevated new tracks and autopilot function on those tracks. Zürich Geneva in 25 minutes, Lucerne London in 1.5 hours. New York to Austin Texas in 5. Or crossing the entire Australian continent east to west in 7 hours. With your own individual craft, door to door, at any time you like.

“Impossible?” Well, that is precisely what was said about the railroad in 1800 and about cars in 1900. Now we have 2007. What are we waiting for?

### 7.4.1 Basic aspects

The new tracks will be elevated ca. 20 feet above the ground. Pillars will hold the track with a distance between pillars of ca. 150 feet. This geometric concept will protect nature as far as possible: The earthbound biotopes are not interfered at all, and the interfered air sector will be very small. It is even planned to keep birds away from the potentially dangerous zone by ultrasound and other innovative devices.



Fig. 16: Innovative crafts on innovative tracks

On highspeed-sections, in a distance of 60 feet sideways to the track, trees shall be planted, wherever cities or villages are near by. This will optically isolate the track and to keep a natural picture.

The cost target setting for the elevated tracks is reducing all necessary investments per mile by a factor ten, compared to a standard highway (two lanes per direction) or to



a train track (with one track for each direction). In numbers: From about 6 Million \$ per mile to 600 000 \$ per mile.

The next fig. shows, how the standard driving position of the craft would look like. It would be exactly centered in the middle of the track:



Fig. 17: Craft centered in the middle of the track

There will be just one lane for each direction. Everybody will travel in one trace, at exactly the same (high) speed. Due to the fully automatic control of the system, in rush-hours the capacity target of one lane is up to 10 vehicles a second. If that capacity is not sufficient for a certain region, that region will be equipped with more than one track per direction. Since the controlling is automatic, there can be more lanes used to get into the cities in the morning and more lanes to get out in the evening. The challenge is in the controlling system and in the “delta regions”: There will be one delta region sending the crafts up on the track, and another delta region guiding the crafts down from the track into the target region. These systems will be capable to logistically handle all crafts at any time, without ever determining a traffic jam on the elevated tracks.

The delta region will be very similar to a blood circulation system, that gets finer and finer the closer it gets to an organ to be supplied and that gets more and more concentrated again as soon as the stream is directed outward.

Since the tracks are very slim, there are a lot of chances to integrate a fine network into big cities. Most of the delta region will be still elevated, not to be object of any interference. At the very end of the delta system the crafts get down on ramps and are handed over to the driver at defined hand-over places. The driver will then continue in manual mode and use the old road network of the cities manually. The situation entering the delta to go up on a high speed track again will be the same, just the other way round.



Later even the manual city regions will be fully automated. Who then wants to drive manually will be able to do so in certain regions, especially designed for manual driving.

The track will provide electric power, that originates from huge solar power plants. The crafts will get their electric energy out of the track, most likely in an inductive way. The electric transmission line will be hidden inside the track profile.

All these elevated tracks will be part of a fully automated, global traffic system. Most of the autopilot intelligence will be in the crafts. This strategy keeps track costs low and simplifies further evolution of the system. With each autopilot upgrade automated functions get better and better, without the need of changing or modifying tracks.

Anyhow, some cheap but effective system elements of the autopilot system can be in the track.

Since the track is slim and the crafts will be of low projected area, tunnel profiles can be smaller and bridges lighter, additionally saving track costs per mile.

As a result, more new tracks can be built and longer distances covered. A “new silk road” will be impossible to set up as “a standard highway”. And the highway travel speed would be way too low to travel it all the way to Beijing.

#### 7.4.2 Security improvement

To improve security in severe conditions like ice rain or storm, the track will get several security systems. The first will be two V-shaped profiles left and right from the center. All crafts are steered to this V-shape as soon as weather conditions reach a critical level. The tires will slip down two or three inches, into the V-shape, and now the streamliner is actually guided by a physical rail. The balance is made sure now by a mechatronic balance pendulum actuator and by aerodynamic steering: All streamliners will have powerful ailerons to balance the craft while driving in the V-rail or to compensate side-winds in any other case.

In the worst case even the hydraulic side wheels will come down to stabilize the streamliner while it follows the V-shape. Opposite to the V-rail side of the track there will be an emergency lane for a craft with mechanical problems. Anyhow: The streamliners will be designed and maintained according to aeronautic and Shinkansen standards. Additionally there will be all kinds of preventive checks of tires and all kinds of critical components BEFORE a streamliner enters the automated highspeed net. If there is anything even just slightly questionable, it will not enter the track system. It will be sent to maintenance first. There will be a streamliner on an emergency track may be once a month, worldwide.

Anyhow, to operate automated maintenance and inspections on the tracks, there will be a robot system operating sideways of the emergency lane. These robots will be capable to transport a stranded streamliner to the next service station automatically and immediately.

To increase the systems safety for a craft having to approach the emergency lane, a catch-system is planned too. E.g. if a tire explodes, the aerodynamic rudders will anyhow force the craft towards the emergency lane, where a robot arm will come out of the craft and stabilize it within a guiding rail, comparable to the guiding rail of a real roller coaster.



Fig. 18: V-shaped rail for secure driving even in extreme weather

While driving in the V-shape, speeds can be reduced compared to traveling on the centered track at best weather conditions.

Specialized “robot arms” of the craft will additionally be able to link to the outer bar of the track. Without elaborating this in detail right now, there will be even two outer bars: An upper one for the craft to hold itself, and a lower one for a robot security-, inspection- and maintenance robot system autonomously and permanently checking the track or getting a craft with a defect down from the track and automatically transport it to the next service station.

There is one more advantage of the V-shape: It would allow to ascend or descend the tracks course in a massive way. Without the attempt to finally discuss this here, there might be some cases where the track goes straight over the mountain, and not through a tunnel, or where it follows the profile of a valley 21 feet above the ground, and not crosses it on a high bridge. The traction in the V-shape will be enormous. It works like a chock.

If not using the massively increased traction inside the V-shape for ascends or descends, it can be used as well on acceleration- or deceleration-strips to shorten them.

The V-shape itself would be open at its lower side to allow rain and dust to fall right through and to improve aerodynamics of the tires section of the vehicle.

To get out of the rail again there will be some construction like a railroad switch every 10 miles. To get into the V-rail will be possible everywhere, so all crafts on the track could get access to the V-rail at the same time.



As we see, a lot of options come with a totally new system. Automated guidance, improved aerodynamics, improved traction and security and much more. Besides massively increased overall effectiveness, this is another advantage of true innovations: They are completely new, and hence they can be designed exactly according to new needs.



Fig. 19: Acabion with pendulum and aerodynamic-balance in the V-rail

Since – for driving dynamics reasons – the front wheel of the streamliner craft will be less wide than the rear wheel, the craft will take an additional negative angle, slightly increasing the aerodynamic drag, but offering additional stability, too.

### 7.4.3 Acoustic improvement

Four wheel cars create a lot of noise. Especially their tires are loud. What many people do not know is, that above 30 mph the tires start to generate more noises than the engine. What you hear in a distance to a highway are the tire-noises.

The heavier a car gets, the more tire noises it generates. Since the tires contact the road with a wide profile, the situation even gets worse.

Future streamliners, rolling on super-bike tires and having a total weight of 20% of a car will be very, very quiet. And as soon as they use pure electric drives, they will be quiet as a birds flight.



#### 7.4.4 Functionality aspects with / without new tracks

The streamliners will work on sophisticated new tracks as well as they will operate on any of today's streets, from field roads up to highways. This is crucial, because it means that the crafts can come, before the new tracks appear.

This scenario is comparable to the car in early 20<sup>th</sup> century. It came, when there were just field roads. And the highways came much later.

**On today's roads, the streamliners will achieve a five- to twenty-fold better efficiency than today's cars. So they will make a fine, true innovation now, even if the elevated tracks will come much later.**



## 7.5 TRUE INNOVATION OF TRAFFIC CONTROL

To reduce the horrifying death toll of earthbound individual traffic, the new track system will be fully automated from day one. This allows higher speeds, smooth operation, no traffic jam, high capacity and a massive increase of comfort: Even the driver can relax now, read a book, look outside, have a drink or even take a nap.

But before we come to the fully automated tracks, there can be even full automation while driving in the old road network: Each fully automated system that would anyhow come up one day for conventional four-wheel cars can be implemented in a much more efficient two wheel craft anyhow.





## 7.6 TRUE INNOVATION IN TERMS OF AERODYNAMICS

### 7.6.1 Aerodynamic (r)evolution, stage I

To generate little turbulences, the body of an Acabion is basically shaped like a dolphin. The aerodynamic drag can be reduced down to  $c_d=0.075$  on flat roads.

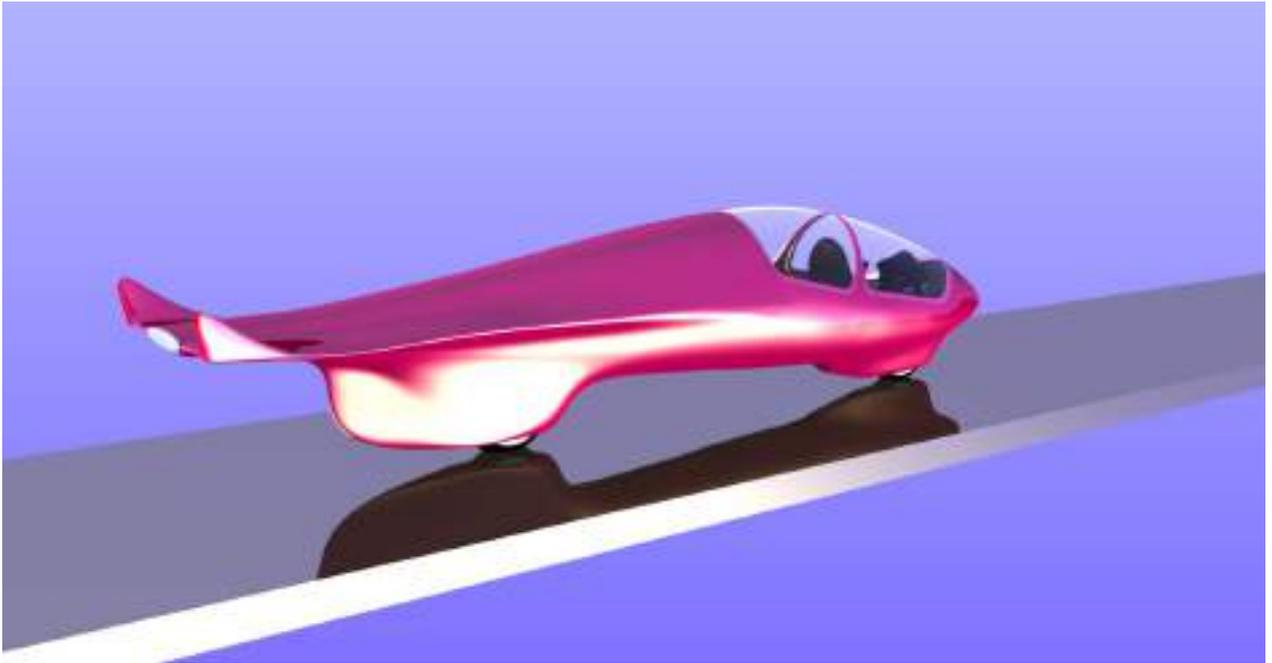


Fig. 20: Acabion as a highly efficient and super fast electric craft,  **$c_d=0.075$  on a plane surface like a road, 200 mph at 20.5 KW, two passengers and 88 mpg**

The drag of 0.075 will be achieved by a prolonged rear section and fully covered wheels. For steering operations at low speed, the front wheel cover will be able to open. At increasing speeds it will close and at high speeds the steering angles are very small anyhow, so that the cover can stay closed. We name all this is an “aerodynamic (r)evolution stage I”, reducing drag from 0.3 (car) to 0.075 (streamliner) and reducing projected areas from 10 square feet to 3. The effect of very low projected area, combined with very low drag multiplies to an enormous result: Efficiency of such a craft will be increased more than 10 times towards a traditional car. (+1000%).

### 7.6.2 Aerodynamic (r)evolution, stage II

To advance aerodynamic quality of the traffic system, the track profile will have to be an integrated part of overall aerodynamic optimization. This optimization has to be worked



out thoroughly before the first elevated track is installed. The reason is easy to be explained: A standard car has an aerodynamic drag coefficient of something like  $c_d=0,3$ . The Acabion generation IV will reduce this to  $c_d=0,11$  and generation VI to  $c_d=0,075$  on a flat road. But even that is not the end of the flagpole. It is not by far. E.g. an airplane achieves  $c_d=0,02$  and even less. And we should never forget, that halving  $c_d$ , means halving energy consumption.

The question is, why is the airplane so much better than the best car could ever be? The reason is: The airplane does not have to deal with a road: Hence the airflow around an airplane can be absolutely symmetric, and each air volume under the plane can be displaced as easy as volumes above the plane. With a car it can't: The air volumes that happen to get under the car can not be displaced that easy, because there is the road, and it is massively hindering them. This problem can be solved partially by the craft, and partially by the road. The less wide the craft gets, the less negative influence can result from the road. This is one more reason for the Acabion to be really slim and to be a two wheel concept. This configuration gets the maximum out of the craft, The road on the other hand must not be flat. It is "flat" in our mind-sets, because we are used to it and we do not know something different. But that will be the eternal challenge of any true innovator: To find something that is really better, because it lets go off futile relicts of the past. And as the following picture shows, the center region of a track's crosswise profile can e.g. look like a section of a sphere:



Fig. 21: Raised center of the track profile for further system optimization  
 **$c_d=0,05$ , 200 mph at 14 KW, two passengers and 132 mpg**

On such a track, any air volume under the craft can be displaced more easily, because the road is further away from the craft now. Hence the influence of the road gets smaller.



This will result in a reduced drag coefficient of the craft driving on the center of the raised profile.

The radius of the center cross section could be even much bigger, as depicted in the following fig.:



Fig. 22: Increased radius of center cross section

In case of an increased radius, the aerodynamic effect could raise, as well as driving stability. In case of a severe side wind, the craft could “hide” on the opposite side, driving in the V-shape in the leeward side.

It is not answered yet, what exact profile the track will have. And it is not defined yet, how much positive effect in aerodynamic drag will be achieved. But some advantages are for sure:

1. The drag will get smaller. The raised profile is the opposite to a tunnel, and it is well known, that the aerodynamic drag gets worse in a tunnel. So it is just logic, that it will get better on a track with a raised profile.
2. The exact shape will be a matter of an evolutionary optimization, based on computer simulations and practical tests. There are different criteria. The aerodynamic quality is one of them. The security of the craft to be still perfectly steerable and controllable is another one.
3. A raised profile will have even more advantages, than mere aerodynamic ones. E.g. it can be used to constantly keep the tires in a perfect shape: Since super bike tires are used, on a long straight journey without any curves these tires would loose their round contour and would wear off in their middle. By letting the



craft oscillate on the raised section of the track, gently and unnoticeable for the passengers, the tires can be kept in ideal, round shape.

4. In heavy rain a raised profile will allow water to run to the sides fast, and all kinds of dirt will also tend to the sides. The active center of the lane hence will be almost self cleaning.
5. In a curve the crafts can drive non symmetric towards the raised section in a way that the tires to not have to take shear forces.

Several driving tests on raised profiles as shown already took place. The clearly show up, that an absolutely sturdy and predictable operation is possible.

Stage II will provide up to 1500% improved efficiency towards todays cars.

### 7.6.3 Aerodynamic (r)evolution, stage III

If the first stage of aerodynamic (r)evolution was in the craft, and the second in the track, the third stage of aerodynamic (r)evolution is in the control and guidance system: It will block crafts to “flocks”. Like migratory birds form a V, the crafts on the elevated tracks will form flocks, driving very close to each other, reducing aerodynamic drag further more.

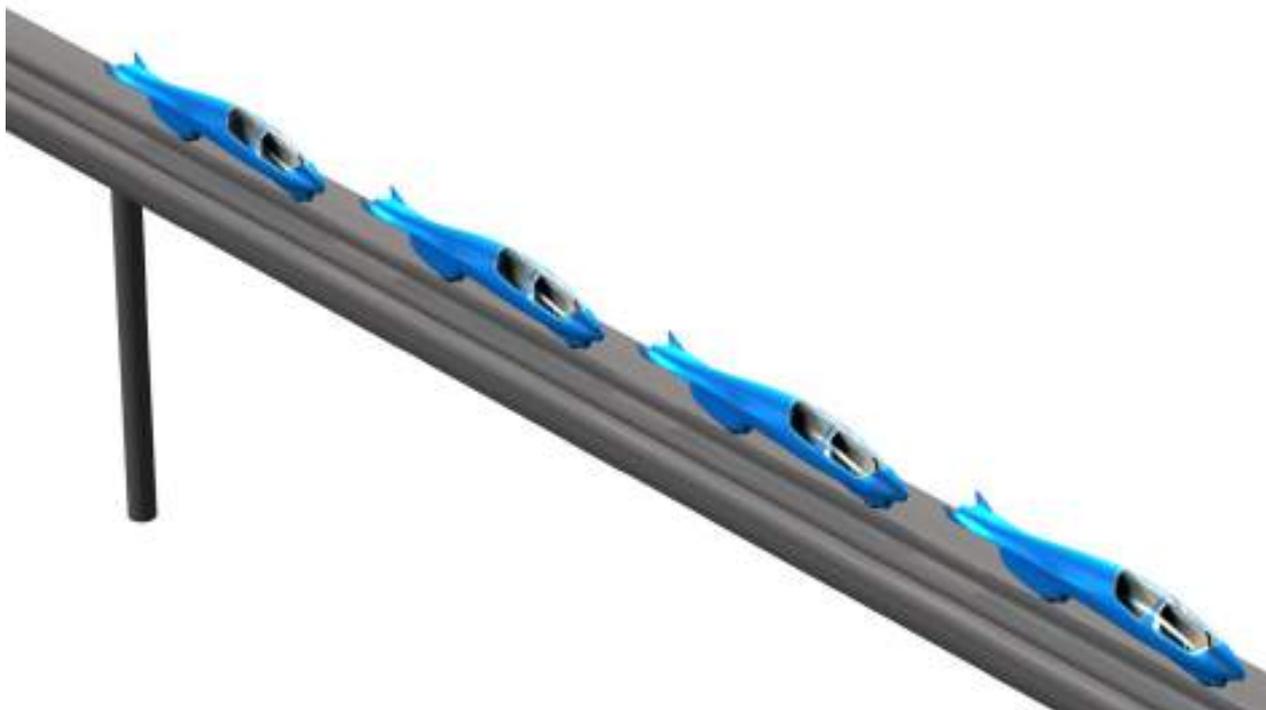


Fig. 23: “Flock strategy” driving  
 **$c_d=0,03$ , 200 mph at 8 KW, 216 mpg for the transport of two passengers**

If we assume, that the “flock-strategy” can reduce the drag of each of its crafts to 0.03, this will result in 200 mph at 8 KW power setting or in 350 mph at 44 KW.

Stage III will provide up to 2500% improved efficiency towards todays cars.



#### 7.6.4 Aerodynamic (r)evolution stage IV

The stage IV of aerodynamic (r)evolution will consist of Micro- or Nano surfaces like riblet structures, similar to sharks skins. This might reduce the drag to 0.02 and may be even lower. That would mean 350 mph at 31 KW and still 103 mpg. We talk about solar electric power supply anyhow, but we use the “mpg, miles per gallon” as a reference.

We come back now to the motto of this proposal *“To have a healthy disregard for the impossible”*: At this point we can state one simple thing: It is acceptable to disregard the impossible. Because it is not impossible at all. It can easily be done, if we just enter the appropriate mind-set- and technology corridor.

#### 7.6.5 Aerodynamic (r)evolution stage V

This chapter simply expresses the conviction, that there will be more aerodynamic things to find out than expressed by the aerodynamic stages I to IV. There is an end of technical perfection if people involved see no further options. But at Acabion we always will. Sophisticated micro treatment of the boundary layer will be one of the issues.

### 7.7 Traffic system, holistic view at some further aspects

Up to this chapter, there might be the impression, that future will be all about two-seat crafts. Well, they will be the dominant species covering about 90% of all travel. But here will be families, wanting to travel in one craft, even as four or more people, plus a dog or may be two, plus a picnic set or whatever.

As a result, there will be four-seat crafts, too, and even nine-seat versions will be around. And those crafts can and will have four wheels. The next chapters will give examples of how future four-wheel crafts can look like. They will have to be much more efficient than today's four-wheel crafts, too. Anyhow we will work out, that the never will be as efficient as a craft with seats just behind each other. The two-wheel Acabion defines the ultimate efficiency and it defines the ONLY vehicle, being able to drive on future high-speed-tracks. This will make future four-wheel crafts an interesting category, but always for shorter distances only. In the year 2100, almost no one will travel a distance of 1000 miles in a four-wheel craft. But a lot of people will travel it – even frequently – in their two-wheel streamliners. The “GTBO” stands for “Grand Turismo, Bionic Optimized”.

The “Grande Tour” will be handled at more than 300 mph by the two-wheel “GTBOs” on the elevated tracks. Special kinds of transports such as family vacation, airport shuttle- or taxi-services can take place at under 120 mph in four-wheel crafts, and on standard roads only. We will have a look at two versions of four-wheel crafts: A four-seat (“Acabion Elin”), and a nine-seat (“Acabion Orca”). And to make the picture even wider, we will append scooters and motorbikes of the 21<sup>st</sup> Century, too (“Acabion Marley”).





**IMPORTANT MESSAGE BEFORE WE CONTINUE:**

**The Acabion GTBO comes first and has the highest priority. It is the best whenever driving with one or two people. It is the ultimately sophisticated one in terms of its mobility potential, the fastest, the most efficient and hence it is the master copy of all other crafts.**



Acabion GTBO



Acabion Marley



Acabion Elin



Acabion Orca

Fig. 24: The high-speed and long-range GTBO as the master copy for all other crafts.





### 7.7.1 Four-wheel fourseat passenger craft “Acabion Elin”

As elaborated in chapter “idealistic view”, any optimized craft rolls on wheels, that are surrounded by aerodynamic covers. But different than a “pure aerodynamic object” a real car has to drive curves and fulfill all kinds of practical aspects. These determine, that a more differentiated chassis-design gets the advantage. The wheel covers are not totally “melted” with the craft’s body. They are separate, anyhow covered units:

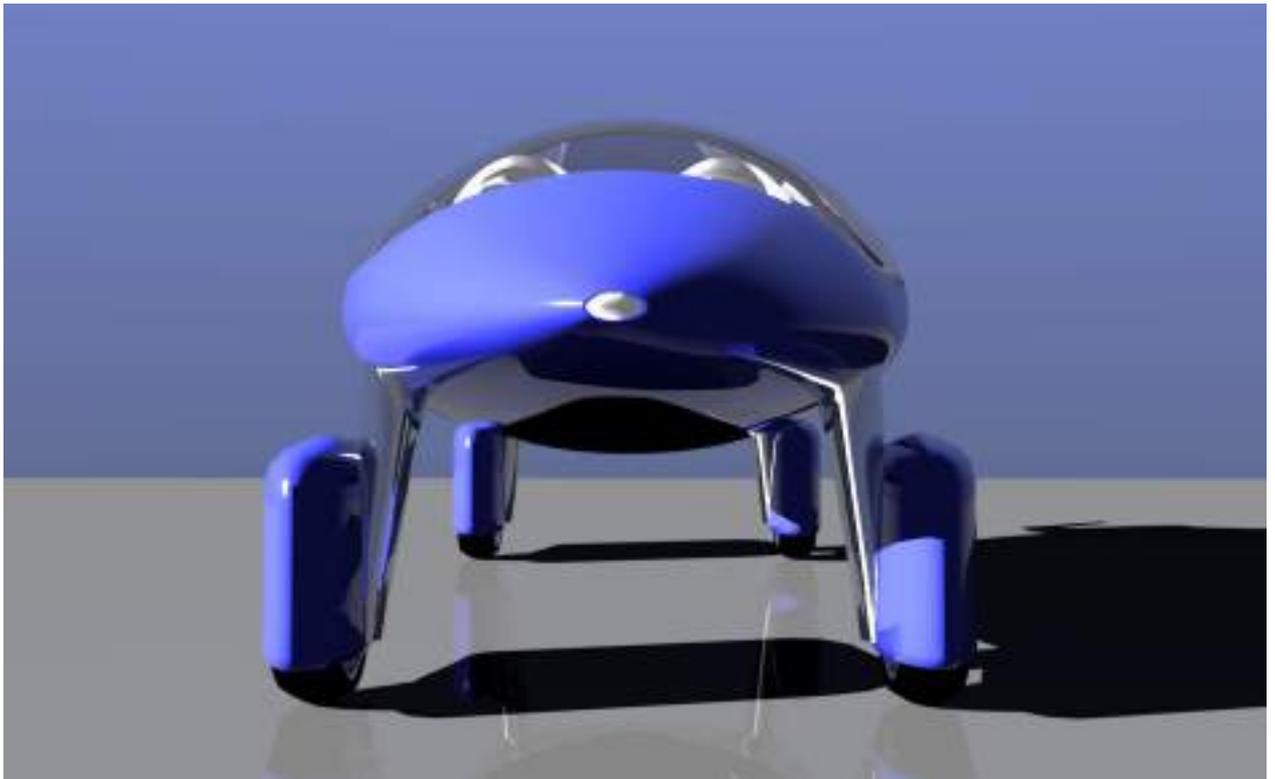


Fig 25: “Acabion Elin”: Four-seat, four-wheel 100 mph midrange craft of the 21<sup>st</sup> century

As clearly to be seen there is a lot of space between the road and the passenger cell. The distance is 25 inches. The underbody section of the passenger cell is as smooth as an aircrafts underbody. It is no question at all, if such a design makes sense or not. It is a question, if we either *“refuse to have efficient cars, and insist on destroying the nature”* or if we *“accept that physics is as it is, and want to stop global warming”*.

This way several advantages are achieved, without causing considerable losses in aerodynamic effectiveness:

1. The wheels covers can be adjusted in height or even disassembled for off-road use.
2. The maintenance is easier, because after disassembling the wheel cover a wheel can be easily changed.
3. All wheels can easily steer now, without the need of an “opening” or otherwise complicated type of cover.
4. The “landing gears” or “legs” are covered separately, with a slim cover. This saves projected area.



5. Due to 5) the vehicle's body can be elevated, offering the chance for a symmetric profile in side view, avoiding upward forces or increased aerodynamic drag.
6. The vehicle can lean in curves, due to height adjustable "landing gears".

Fourwheel are NOT able to run on the future high-speed tracks. They are invented to make taxi- or shuttle-traffic on conventional roads more efficient.

The craft will have a body like an airplane, it will have two canopies and two times two seats. It is tempting in its facts. We compare it to a traditional four-wheel car:

Craft	A square feet	$c_d$	Weight / lbs	KW for 100 mph	mpg at 100 mph
Acabion GTBO	6.3	0.1	790	4	230
Acabion Elin	21.5	0.1	1400	12	82
Standard Car	25	0.3	3000	42	23

Chart 5: Comparison between Acabion GTBO, Elin and a standard car

As we see, the new concept Acabion Elin reduces the power needed for 100 mph from 42 to 12 KW, compared to a standard car, and increases efficiency at that speed from 23 to 82 miles per gallon. To achieve this, it is essential to minimize the aerodynamic drag by lifting the body from the surface with "landing gears" like an airplane:

The next fig. shows the Acabion Elin in side view. Its length is 21 ½ feet. This is a message that has to be learned: Aerodynamic optimization means long crafts:

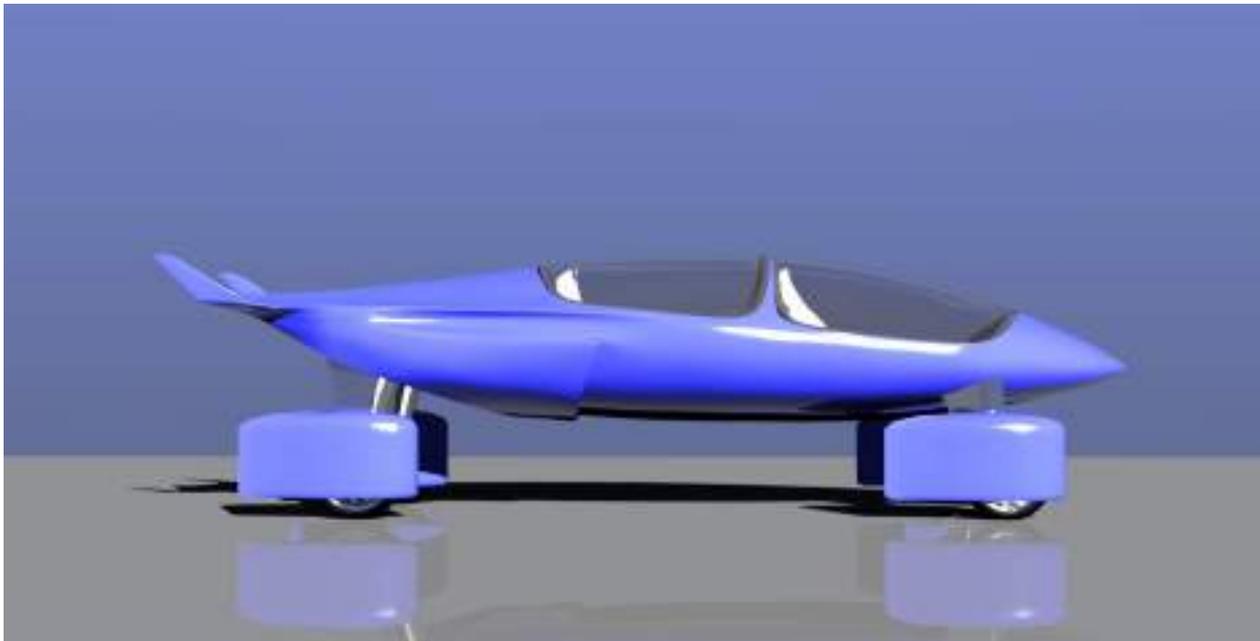


Fig. 26: Acabion Elin, side view

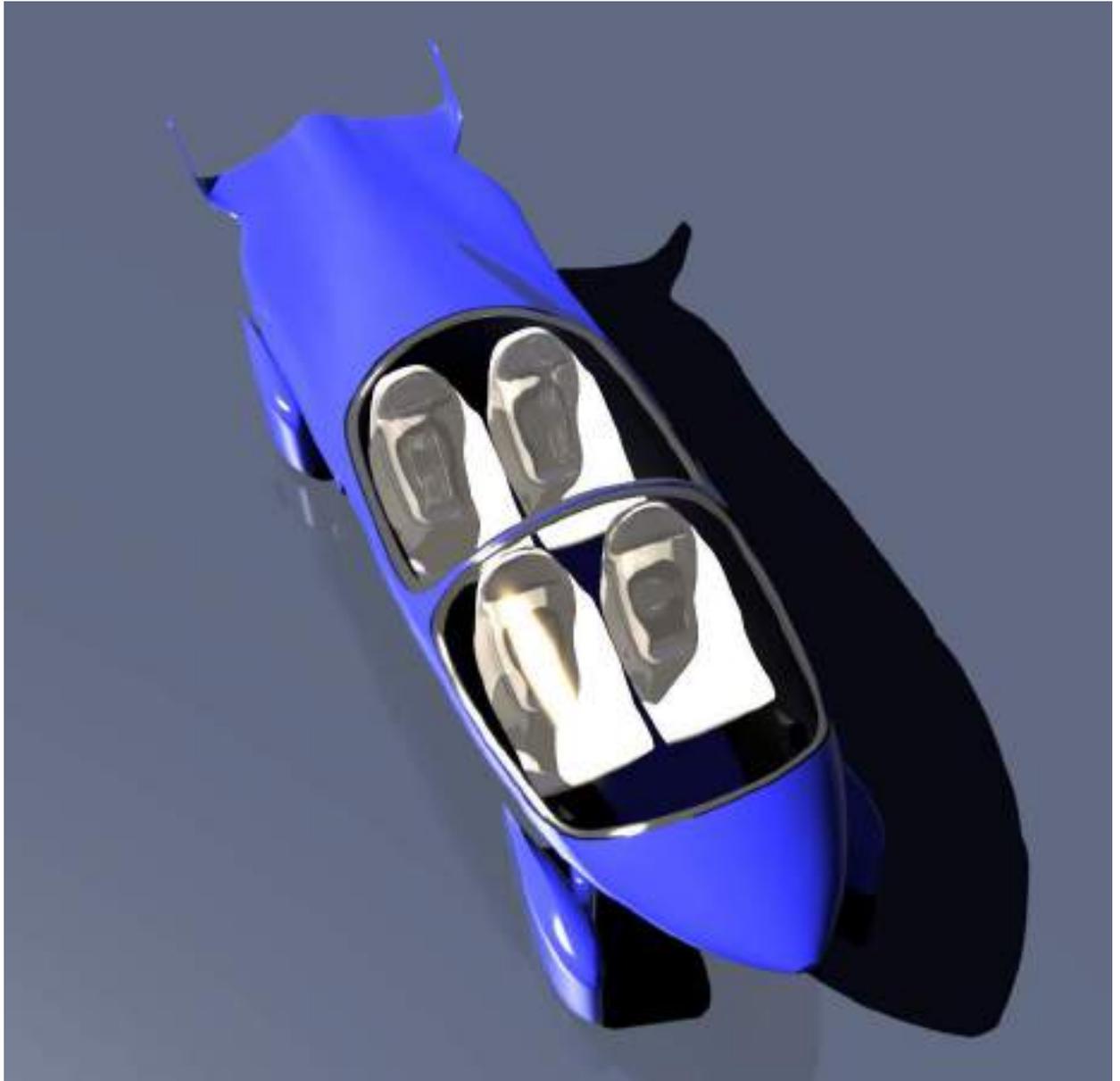


Fig. 27: Acabion Elin top view

To guarantee its low weight, the craft actually will be built more like an airplane than like a car. Plus: It will actively lean in curves, to make its dynamic characteristics comfortable as well as sturdy.

As mentioned before, the wheel covers can adjust to low speed or to high speed operation. In low speed, the covers stay away from the ground providing ca. 5 inches of free space, not to get in trouble with little obstacles like a curbside. At high speeds these 5 inches would cause a lot of aerodynamic losses. And hence at high speed the covers are extended almost to the road surface. Whenever a wheel comes up a bit due to its suspension, the cover will follow the wheel and keep its distance to the surface:

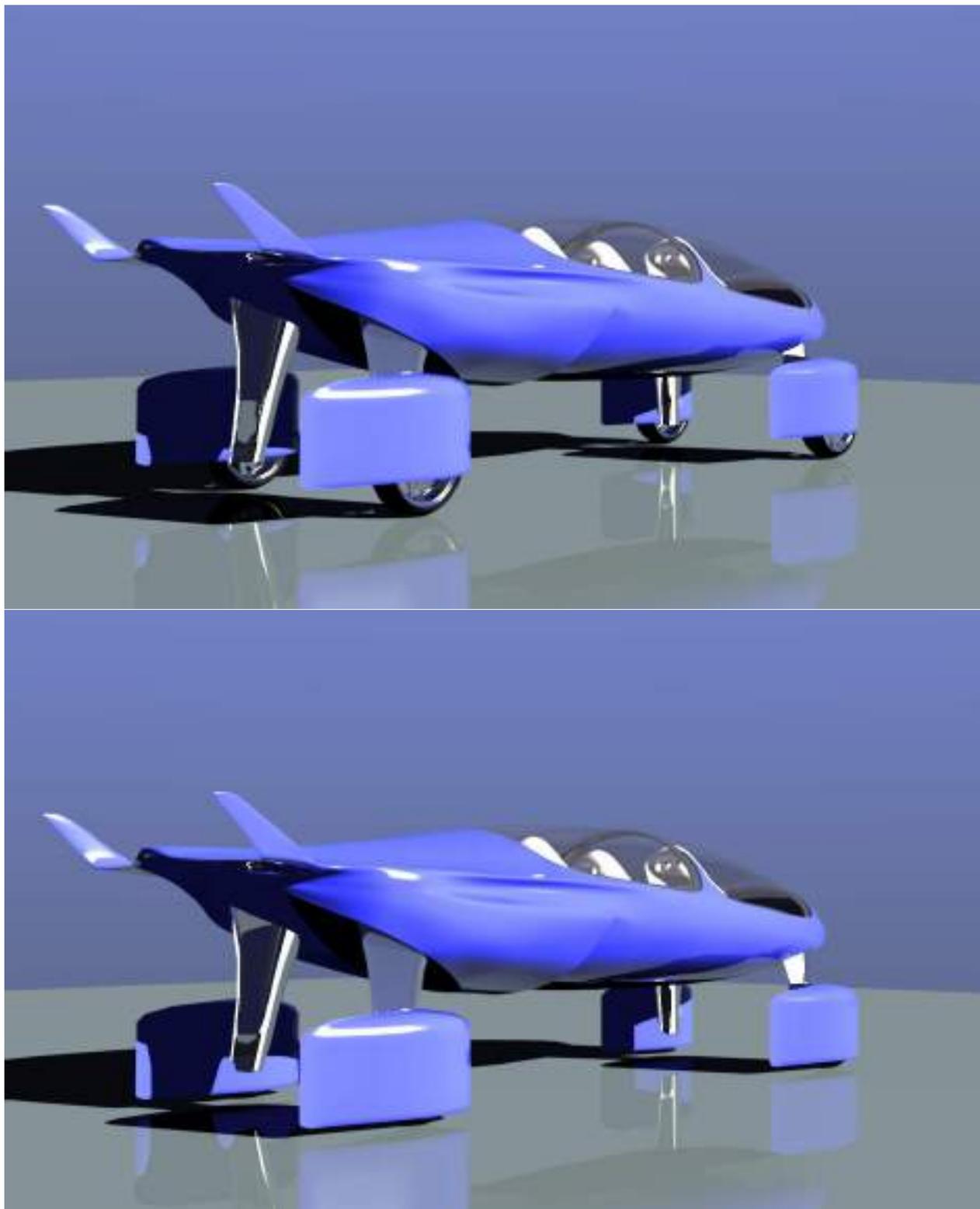


Fig. 28: Acabion Elin in urban and in high speed traffic with wheel covers up and down

The next fig. shows an Acabion Elin in a right curve. The entire vehicle is leaning into that curve:

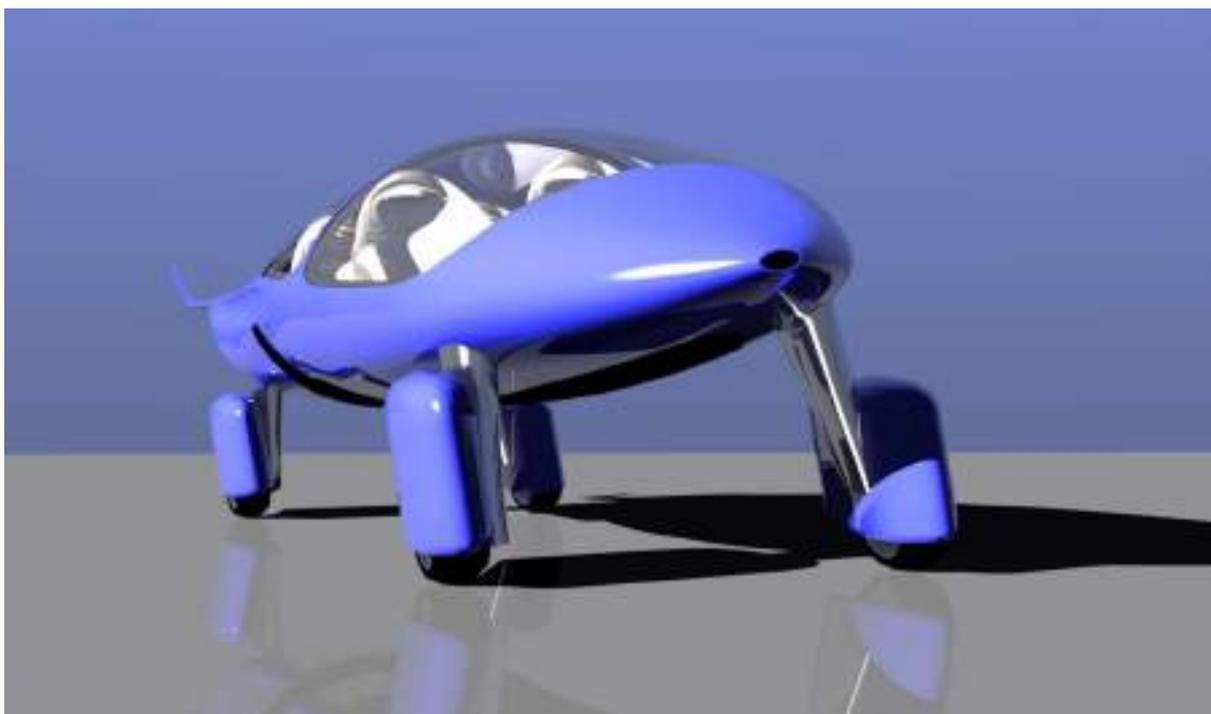


Fig. 29: Acabion Elin, leaning in a right curve

Next fig. shows the Acabion Elin without its aerodynamic wheel- and gear-covers:



Fig 30: Acabion Elin without wheel- and gear-covers



The doors will be like airplane doors. They will flap down, becoming a stair, and giving access to the passenger cell:

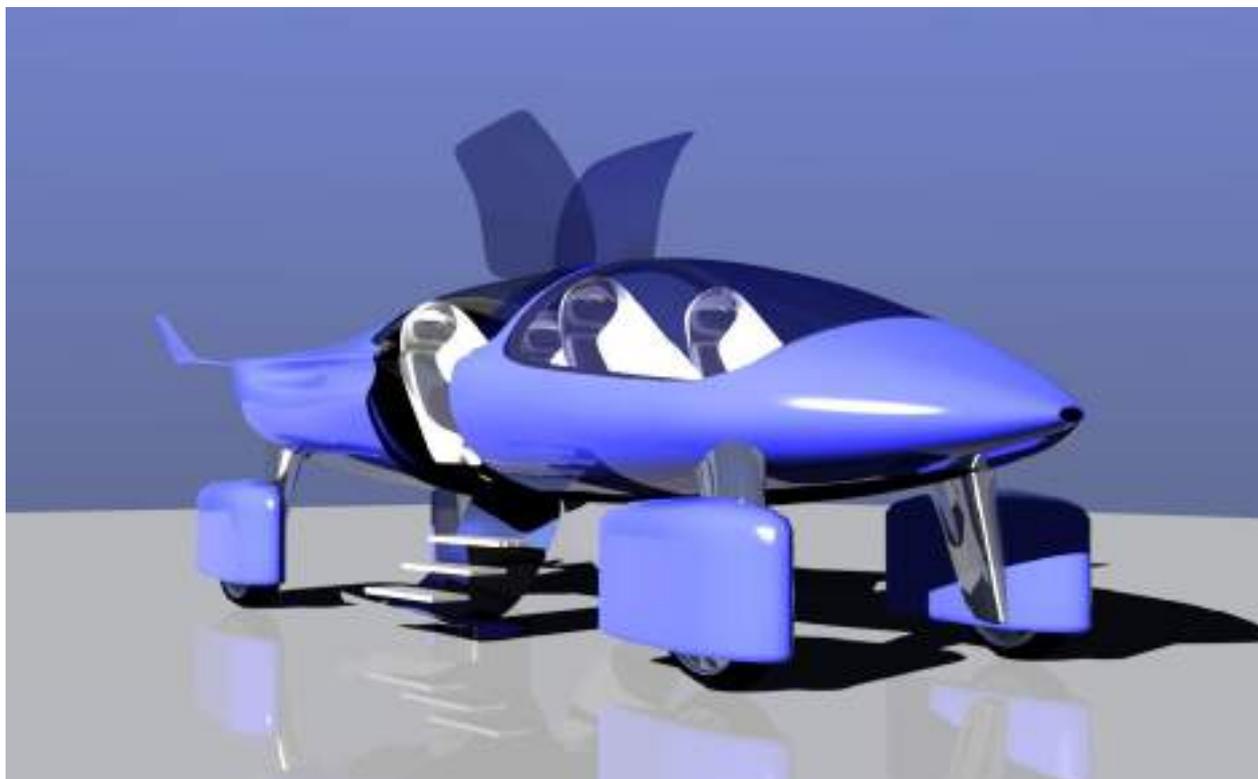


Fig. 31: Acabion Elin door concept

The stair elements will turn 180 degrees while the door flaps up. Their undersides form the doors inner cover.

As indicated in fig. 17, too, the canopies can be darkened or mirrored to keep the heat of the sun outside.

As was elaborated before, there is no question at all, if the Acabion GTBO or the Acabion E will be around. They will, because they originate from physics. And in the same stringency and logic there is no question, if the Acabion Elin will be around. It will, for efficiencies and environments sake. Well, and even if mankind would say so, there would be Acabion Elin types coming up, anyhow: Because they will be the only ones efficient enough to be operated. So, if there is not just a wish for a “museum-version” or a “garage-stuffing”, the choice will be “Acabion Elin”. Not because someone wants it or does not want it. Because physics is as it is, and because – as a result of physics – bionics is as it is, too.

There can be a huge variety of crafts. But for high speed and long distance operation, they will anyhow look like relatives to fast fishes, or like sharks, or like an orca or like a dolphin, anyhow. Or like relatives to the two-wheel versions of the Acabion, which amounts to the same thing.

The design of the rear wings, bionically spoken the 3D-shape of the fins, can differ. And there can be differences in the way the task of creating the “landing gears” is solved. But there will be a streamlined body, elevated on its streamline-covered wheels.



### 7.7.2 Nine-seat passenger car, Acabion “Orca”

To make it very clear that there is no reason at all, why even an “SUV” should be as awkward and as bulky as it is today, Acabion will offer with a nine-seater, too. The “Orca” has variable seat configurations, e.g. as a six adults plus three children version:



Fig. 32: Acabion Orca. A 250 mph SUV, and still going efficient

Like the “Elin” it offers a dynamic four-wheel-drive and -steering. The overall length of the craft is 25 feet, comparable to a today’s “stretch limousine”.

Due to its aerodynamic effectiveness, the Orca will achieve e.g. 125 mph at a power-setting of 20 KW. As a nine-seater! And it will run for 55 mpg at that speed.

For both Elin and Orca the elevation of the passenger cell will be optimized for optimized aerodynamics and sturdiness.

Types like the Elin or the Orca will not cover mass mobility. Two-wheel crafts will do that longterm, because they are the only ones capable to use the ultra high speed tracks. On standard roads, there will be a colorful mixture of two-, three- and four-wheel crafts. All of them delivering almost incomparably higher effectiveness than all 20st century crafts ever had.

For families wanting to travel with several people on the high speed tracks, there will come up three- to five-seat versions of the two-wheel Acabion, too. As it was mentioned in the chapter “status quo of automotive engineering”: If an eight-man scull is transported on even narrow country roads without any problems, why can’t two to five people be seated behind one another in a new type of slim, truly effective car?



### 7.7.3 Fundamentally innovative motorbikes and scooters, Acabion “Marley”

To make the picture even more complete, there will be a new way of building scooters and motorbikes, too.

Like all kinds of cars, scooters and motorbikes underwent several even enormous innovations in many of their system elements. But never the entire system was reinvented, according to the needs of efficiency.

The next fig. shows, how Acabion motorbikes will look like:

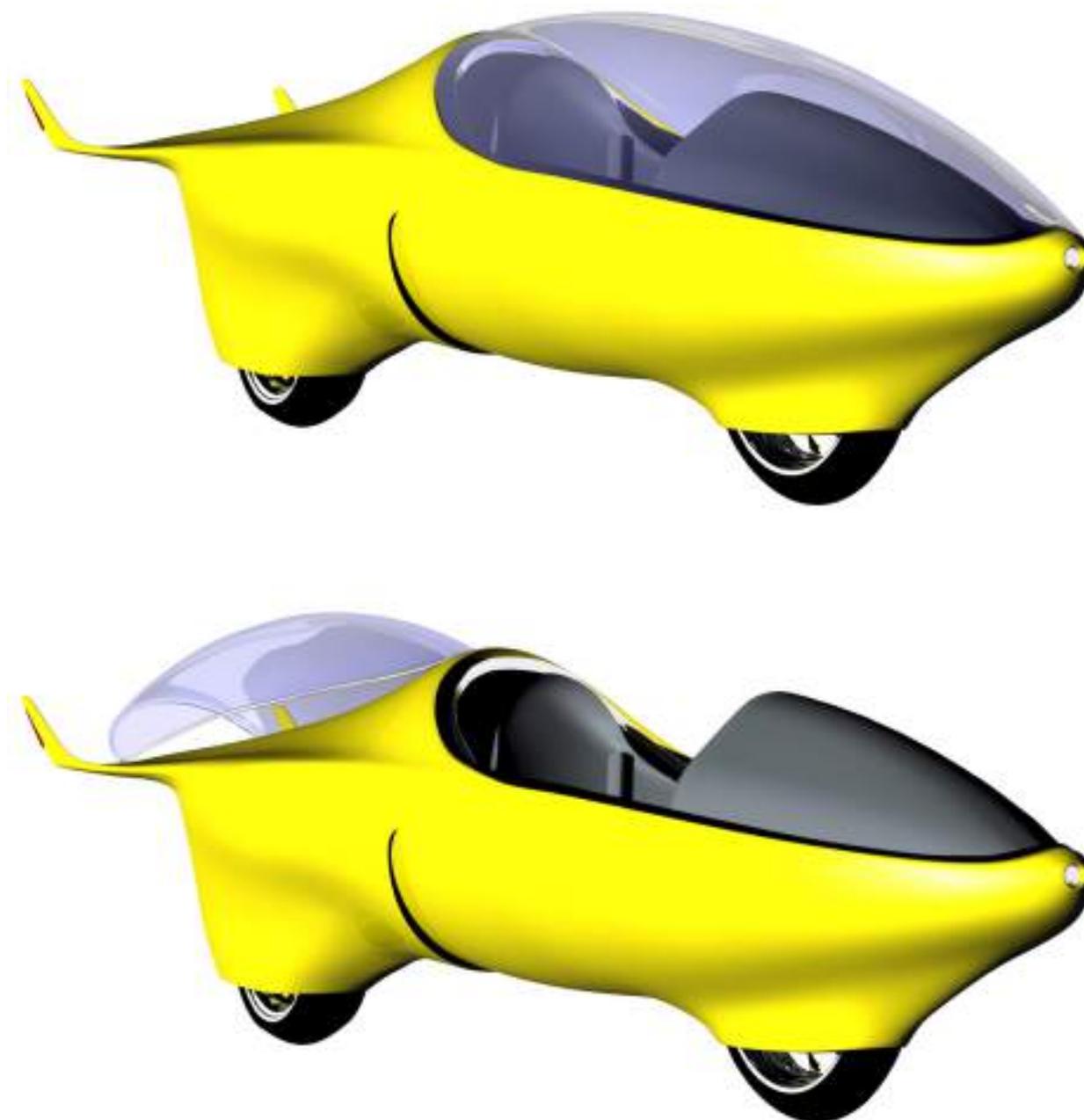


Fig. 33: The 21<sup>st</sup> century motorbike. Streamlined, covered, efficient, super fast and secure, and as a convertible with the canopy on the rear wing



The craft will balance on two wheels, like the GTBO. It will be offered as a one-seat version. A two-seat version will be available, too, with the two passenger placed directly body at body, like on a traditional motorbike. Anyhow it will be much more secure with enclosed passenger-cell, safety-belts, crash-box, overhead-protection etc.

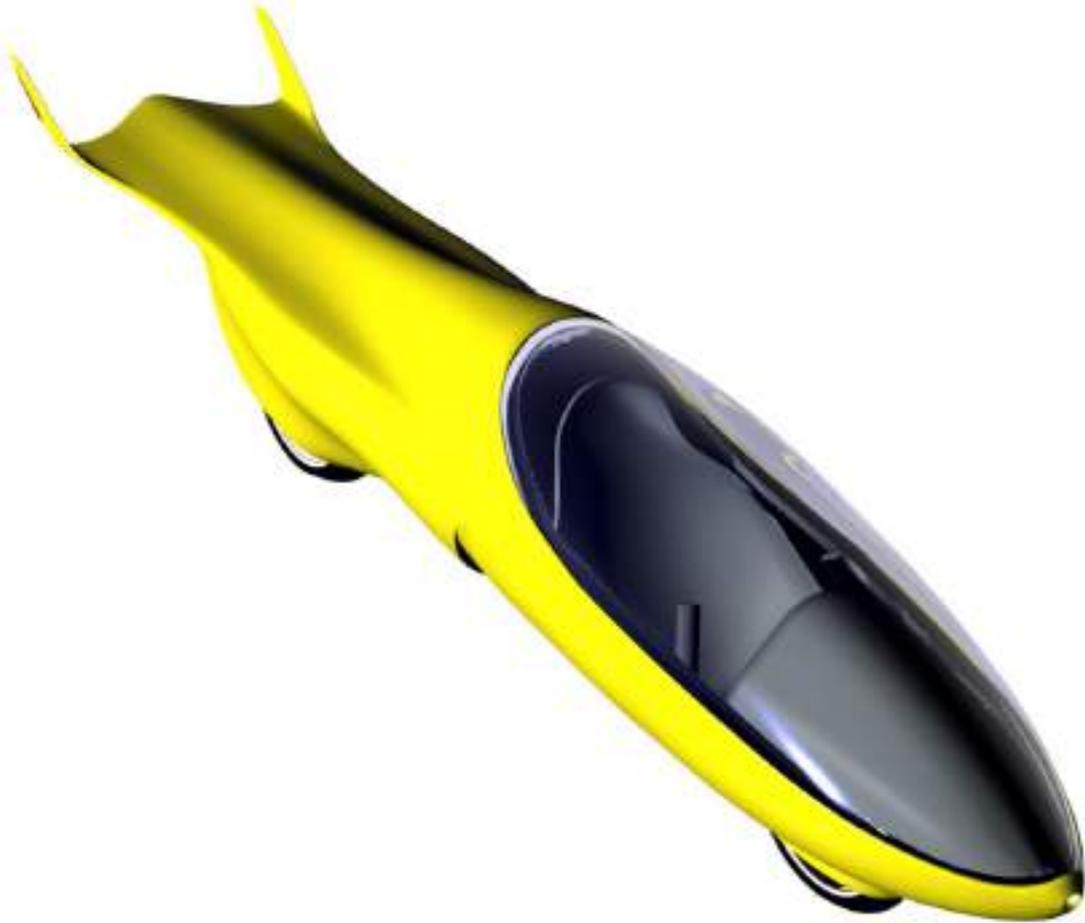


Fig. 34: The 21<sup>st</sup> century motorbike

Especially one-seat versions will be needed, taking 1.1 passengers in average into account. The one-seater crafts can be both aerodynamic and compact, and hence they will safe space for parking.

They can use the same tracks as the longer streamliners. And they will cover the same speed range up to 400 mph (640 km/h).

The next figure shows, how nicely the new track systems can be installed in existing city infrastructure. The vehicles will be relatively fast, super silent and without any pollution. The old ground level roads can be almost free from traffic and a fine space for all people. The “first floor” will be a “fast floor” already. Even in central regions speed can be around 60 mph (100 km/h). On transfer lines even much more.



Fig. 35: The 21<sup>st</sup> century motorbike on new tracks downtown Hong Kong

#### 7.7.4 Cargo-traffic concepts of the future

The holistic Acabion system in the long run will even include cargo transport. Not on the passenger tracks, but on separated ones designed as four-wheel tracks for medium speeds. The relation between passenger- and cargo traffic is very close: Each object, that undergoes earthbound transportation, will have to deal with the atmosphere. Hence the effectiveness of each cargo transport is depending on projected area and aerodynamic drag, too. And the faster the transport gets, the more it has to deal with aerodynamics. Acabion is working on cargo transport concepts, too.

The “cargo-module” will typically have four wheels, because the freight is never defined in its center of gravity. The basic shape of a small-size carrier will be as depicted in the following fig.. It will be based on the ideal concept of covered wheels plus an aerodynamic body, being able to load one or two standardized pallets. The modules will drive as autonomous robots, powered by solar electricity. Several modules can form a “train”. In any way they will find their destination 100% automatic. And if that is a little store downtown Vero Beach.

The essence is the same as with passenger traffic: If the specific costs of an individual module get below the specific costs of “big units” like railroad freight cars, there is no reason for “big units” any more. It is transferring bionic individual flow concepts into technological / logistical application.

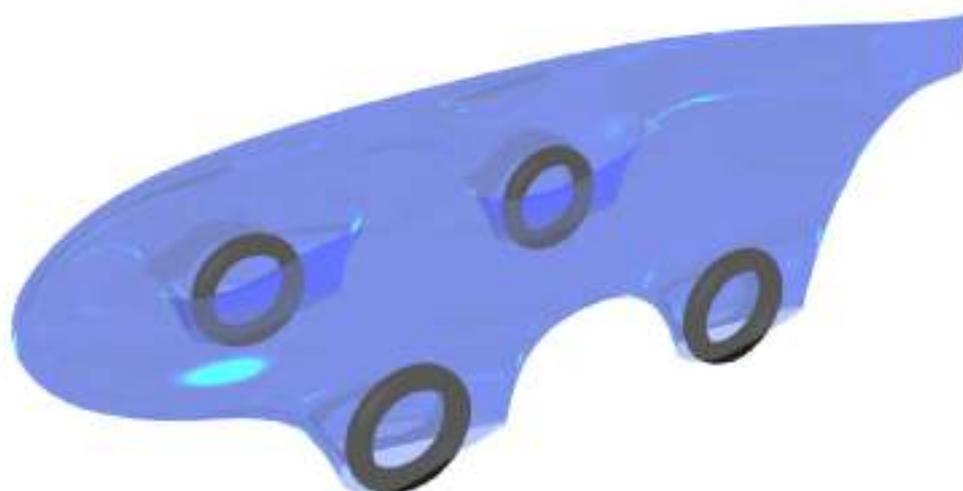


Fig. 36: The 21<sup>st</sup> century cargo module, shown in transparent mode





## 8 OVERAL POTENTIAL OF THE ACABION SYSTEM (R)EVOLUTION

Criteria that define an innovative vehicle are efficiency increase and climate protection. Criteria that define innovative routes are protection of the biotopes, increase of traffic safety and progression of speed level.

From the viewpoint of the traffic system's physical and bionic consequence, today's Acabion GTBO already shows efficiency 7-10 times higher than common cars have. Efficiency like that easily outclasses even cars with hybrid engines or fuel cells. Radical aerodynamic optimization as shown in fig. 8 and 11 further allow to increase future mobility efficiency approximately 50-times compared to today, in other words an increase of five thousand percent. Such optimization is the only permissible way in the long run that is logical and ethical towards nature. Humanity has to stop threatening its life-support system. This way it can do it. This way, and only this way, solar energy will be able to power up the mobility systems of generations to come.

As soon as long-distance tracks are in operation and traffic system ensures general speed over 400 mph (which is feasible solar electrically as well, if only the crafts are true bionic innovations), even air traffic would be unable to compete on any continent. Being able to drastically reduce air traffic offers another opportunity of how to generate positive climate and resource sparing effects in the long run.

Acabion will not endanger the car industry. It is just a small, very idealistic and consequent project. But it sure will stir it up a bit and obligate it to handle. It will raise the development pressure on „monoculture“ of the classical automotive manufacturing. It will increase the pressure so much, that it will be impossible to cook up things like 'LED headlights'. Instead, it will show what truly efficiency improvements are and how they can be cultivated.

As a first step, the Acabion GTBO will seize a part of the highest super sports cars segment. Simultaneously, affordable „electro jets“ will be prepared.

Perhaps more than any other vehicle concept, Acabion is qualified to strengthen mankind's reputation as being able to reinvent itself and to stop global warming. In this way, it could significantly contribute to mobility of the future.



## 9 THE CHANCE OF IMPLEMENTATION: “PLANE-JANE” 100%

It shall be clearly stated, that the system is absolutely realistic in each aspect. There is no technology missing. A lot of system elements have to be developed, like the balance control and traffic guidance systems.

Since all depicted new crafts can roll on standard roads, too, they can come up today, and the additional tracks can come up, as soon as a future generation is convinced enough about their enormous additional potential.



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## 10 THE ACABION ENTERPRISE

Acabion is located in Lucerne, Switzerland. Its mastermind is Dr.-Ing. Peter Maskus, former Porsche-, Mercedes-Benz-, BMW and Toyota Systems Engineer. Mastermind of traffic and future traffic. Mastermind of Toyota Production System and Continuous Improvement same time. He builds mobility like Ettore Bugatti would build it, if he would live today.

Acabion has a worldwide network of cooperation partners. Daniel Tomicic is our representative for Eastern Europe, Australia, China, Japan, India, Russia and South America and runs the Acabion office in Zagreb. Brandon Welti and Mihoko Hakata are our representatives for the United states and run the Office in New York.

Acabion looks back on a tradition of meanwhile 20 years, constantly pushing the vision forward against all obstacles.





## 11 WHY DO WE INITIATE FUNDING

To contribute to stop global warming and humanitarian progress we want to accelerate in our speed launching a new generation of global traffic. Here is a list of issues that require funding:

A) Elaboration of parameters for environmental friendliness of traffic systems. We do not just want to come up with a new traffic system. We clearly and objectively want to measure, what progress we made in an overall balance view.

B) Elaboration of targets for future traffic systems. What do they provide, what do they cost, what overall balance effect do they have.

C) Building up road legal next Acabion GTBO generation V as the “guiding stars” for 21<sup>st</sup> Century traffic.

D) Building up of electric driven two-wheel Acabion to show up what a 200 mph electric craft can do.

E) Building up a scale 1:5 model of a future track, 10 1:5 models included. Fully functional, energy transmission and all balance- and steering functions included. It is a lot cheaper to do this in a scale world first.

F) Analysis of solar electric supply.

G) Design of automated and preventive security systems. Strategy like the Shinkansen.

H) Development of all balance functions for the first 1:1 two-wheel Acabion

I) Building up one four-seat “Elin”, one nine-seat “Orca” and four “Marley” motorbikes: Two urban scooters, fully electric, and two long-distance-crafts fully electric.

J) Aerodynamic optimization track / craft, raised track profiles optimization.

K) Acoustic optimization. Wheel noises etc.

L) Elaboration of potential worldwide traffic nets based on the new high speed passenger- and cargo-tracks.

**M) Depending on funding volume we can start serial production of easily affordable electric streamliner crafts within three years.**





**IF YOU ARE ATTRACTED BY THIS CONCEPT AND WANT TO MAKE IT A DREAM COME TRUE, PLEASE GET IN TOUCH TO DR. PETER MASKUS AT [INFO@ACABION.COM](mailto:INFO@ACABION.COM) NOW.**





## 12 Appendix: Typical questions and answers about crafts and tracks

- 1) Are those vehicles safe? They are kind of small.

Answer A: Yes, they are very safe. The GTBO bodywork structure corresponds to a monocoque of an F1 racing car and so achieves high safety level. Safety has the supreme importance in the complete project. It was also the driving force behind the innovative seats that secure passengers from tip to toe even in the high secure bodywork. For all passengers, the seats will offer even an overhead protection.

Passengers are seated like „in a helmet“. Occupant protection is ensured by further systems such as six points safety belts, safety bar, crumple zone at the front and at the back, or titanium protection against side brunt. Since the vehicle is relatively small, material consumption is accordingly low. Such economization allows investment into high-class materials. This applies as well to mass-produced electric version made from steel plates and aluminum where safety safety is to play crucial role.

Answer B: The integral part of driving safety should be actively generated. Radar systems should prevent tailgating and moisture sensors should reduce engine power and maximum speed on a wet road. Nevertheless, the goal should be bionic system intelligence. No bird flies with a helmet and airbag. The bird would be much too heavy. Instead, it recognizes obstacles and does not fly against them. That is exactly the way, the traffic safety must go. A microchip and some sensors are easier and less expensive than crash structures and airbags. And it is more intelligent to avoid an accident than to allow it and wanting to master its tragic consequences.

- 2) If we build new routes, won't we destroy even more nature?

No, because it is not our goal to build further routes in areas that already have a good motorway and highway net. We want to use the existing infrastructure there. Nevertheless, on a long-term basis, one could declare one motorway trace as the Acabion trace in the first step. It will be actually two active Acabion traces because two Acabions fit comfortably next to each other where just one car can drive. In the second step, supported fast speed lines can be built sideways to hard shoulder, so that additional traces and higher traffic capacity can be achieved without taking up another natural space. Only future generations can then decide whether to build new narrow high tracks instead of new broad motorways. Such a decision will surely depend on whether a future cargo logistics will develop itself toward automated fast speed lines. If it does that, one can build



narrow high tracks for bionic vehicles under those the standard format euro pallet cargo movements takes place in e.g. monorail form.

In areas of low or nonexistent traffic net, particularly in developing countries, new tracks can be instantly considered. A motorway net for Africa, Russian Far East, or for South America is neither financeable nor desirable. It is also technically hardly conceivable to build a motorway version of a silk road from Lisbon to Peking. The fast speed lines could accomplish even this thanks to their enormous cost advantage.

3) Can't the vehicles fall over, if one drives only on two wheels?

Yes, they can. In order not to fall over, they need a certain sensory and coordination intelligence. Since they receive such intelligence, the fall out is however hardly possible. By the fact that they could once fall down, we can recognize Acabion's genuine bionic orientation: Living organisms need their motor function to become stable. Humans can also fall down and nevertheless runs further on both legs. With intact motor function, Acabion is more stable than any „static“ system ever was. The four-wheeled car that does not fall over after one removes its battery and engine, in this regard is a very low developed static system. To make it a future role model just for its static stability would be very foolish. Acabion with highly developed actuators and preventive safety intelligence will be safer than a conventional car can ever be.

Acabion's slimness is thereby no "can" but a "must". Only such concept ensures travel efficiency and secures intact nature even when requirements on national and global mobility ever increase.

4) Won't our grandchildren fall down from the high tracks when driving their vehicles?

No, they won't. The vehicles will follow the central lane fully automatically. This ability is a result of multiple redundancy and several systems independent of each other. Even in the case of a complete system breakdown, rescue systems will seize, i.e. they will take the breakdown vehicle from the line, lead it, slowly stop it, and lift it down from the high track.

5) Can only two-seat crafts be built? And is there any baggage compartment at all?

Sure we can build four- or nine-seater in accordance to the same or analogical principles. The two-seater is just the ideal master copy for later and even larger versions. So, one can naturally generate larger baggage compartments, too. Additionally, the single vehicles can later drive together in the automatic group mode. Thus, whenever and only when the whole family is on its way, a two-



seater „driver version“ is followed by three-seater „family version“. Moreover, a "baggage compartment section" can be added if necessary. There are many interesting solutions imaginable for the future, all of which have the distinction of transporting only as much matter as needed.

For all these variations, the two-seater is the ideal master copy and should therefore developed in the first place.

- 6) Isn't it too complicated if we have to think of electronic balance aggregates or catch systems for the tracks?

No, it is not. As a system, it is indeed quite demanding. But within each function, it aspires the highest possible simplicity. A helicopter is in any aspect considerably more complicated and it flies today already – even in a rescue mission during the heavy storm and in low-altitude flight over the open ocean. In comparison with that, Acabion traffic system is rather simple.

- 7) Can I drive the Acabion even if I do not have a motorcycle driving license? Isn't it too difficult to learn driving such a vehicle?

No, it is easy. One just has to learn it, like driving a car. It is different to driving a car, and hence the training is different, too. This is another indicator showing that we face a true innovation.

Anyhow, the vision is achievement of fully automatic traffic even on normal roads. All such developments, which are in progress for cars, can be used for the Acabion 1:1, i.e. the requirements for trace recognition in the old road system are accurately the same.

- 8) Isn't it uncomfortable to get in? The vehicle is quite small and one has to get in like into a jet or a glider.

At the moment, getting in GTBO prototype is like getting in a jet or a glider. However, vehicles for customers will be complemented with either doors or notably larger hood section. Later on, even the steering should be elevated together with driver hood. So getting in and out will be very easy.

- 9) Aren't the seats uncomfortable? After all, there is not much space inside.

The opposite is true, they are very comfortable. They offer the optimal and completely relaxed ergonomics of a cozy chaise longue by Le Corbusier. Moreover, they support the body from tip to toe.



10) If Acabion is such a great concept, why the automobile industry did not come up with it long ago?

A) The automobile industry is a very big, traditional, and entrenched sector of industry. From our own longtime experience, it operates human resource systems which either do not let „revolutionary“ or „dissenter“ to rise into hierarchy or which separate them completely out of the enterprise. One can become a high positioned automobile manager, if he/she proves high ability to adapt to the given structures. Therefore it is so incredibly difficult to come up with a revolutionary idea and to force it through to its fruition.

B) In principle many enterprises and consulting companies realized that innovations origin almost exclusively on the margins. Withal, these companies are extremely rarely and difficult to find there. Procter&Gamble realized that and therefore sent "scouts" around the world to look for new impulses. They found for example an Italian baker who had filled an ink jet printer with food colors to print small pictures on his cookies. Procter&Gamble bought the idea and soon after started to print on „Pringles“ chips. The turnover rose to around 20%.

Peter Drucker, management guru, pointed out again and again towards the fact that vast majority of innovations developed within completely different industry fields as were they experienced their breakthrough. Glass fiber was not invented by an IT company but by a glass manufacturer who at first didn't know what to do with it.

C) The car manufacturers earn very good money with the old pattern of "a car". Why should they invent something new?

D) A car manufacturer that would bring a concept like Acabion would find itself in rather tricky situation. With such a concept, it would declare its responsibility for wasting valuable resources for many decades and also admit its cardinal concept misapprehension during all those years of producing and proclaiming „the best cars in the world“.

11) However, there is no crash-zone whatsoever in the front of the Acabion!

Sure there is. Before sole of the foot, there are some 50cm to 80cm of carbon used as a crash-box. More crash-zone is neither to be found in a compact car.

On the other hand, the more slender and rounded is a vehicle, the less harmful it is for pedestrians. In this aspect, Acabion outclasses a car completely. It presents far smaller danger than cars do and outperforms even motorcycles.



- 12) If a concept of Acabion is so superior why there are so few reports about it in specialized press?

Since specialized press is financially depending on regular large-scale advertising of car corporations, there is strong intertwining between both parties. It is as well a common praxis that car journalists are invited to attractive presentations of new models and their test drives all over the world, incl. accommodation in luxury hotels. Everyone wants to be in that game, of course. Who will be the lucky one is carefully chosen by the event organizer, i.e. the car manufacturer who pays all the bills.

When the Acabion team asked the editor-in-chief of the German technical magazine „Automobil Produktion, Zeitschrift der (magazine of the) Automotive Elite“ if they could make a report about the Acabion, the answer was word by word as follows: „Mr. Maskus, we have to look if you fit to us.“ And there was no report on Acabion whatsoever. Every email written to „Auto Motor Sport“ (Motorpresse Stuttgart) remained unanswered in more than 10 years and no report on Acabion was ever published there. Fantastic exceptions: „Automobil Revue“ from Switzerland reported about Acabion in detail, as well as Spiegel and Auto Bild in Germany. But it is a few reports in several years. Nothing compared to what each new model of the car lobby gets in publicity.

- 13) Would the market ever accept so fundamentally different system?

Definitely yes. The market accept everything what has a good image, looks good, and provides good facts, i.e. shows profit for the customer. The market needs time to it indeed but if politicians set correct general framework, the market can change faster.

One of the project proposal's goal is also to create an overall balance coefficient of nature and resources compatibleness that should be calculated to every single vehicle from then on. This coefficient should not be manipulable by the manufacturer and could become a basis for tax system one day. Prodigality has to become too expansive to afford, even for the richest.

Waste must become in the long run priceless. Maintenance costs for wastefully and completely senseless resources and nature loading technology concepts would have to rise exponentially. Maintenance costs must rise exponentially for technology concepts which burden resources and nature in a prodigal and completely unreasonable way.

- 14) Why are SUVs particularly popular? After all, they are rather the opposite of Acabion.

SUVs invoke basic instincts such as desire for safety, shelter, and for impressing others. These are well understandable factors for SUVs' success. We should however succeed to objectively evaluate their overall balance and to make it



transparent for everybody how harmful they are for the nature resources, regardless if operated as a diesel or as a hybrid. Their maintenance costs should as well become much more expensive so that the customers are informed correctly about their direct impact on the environment and thus can make their buying decisions with more responsibility.

15) How is it possible that Acabion is 25 times more efficient than a car, although no new engine concept was developed? Isn't it just another advertising slogan that exaggerates a lot?

No, it is not a slogan. It is a pure physical fact. The result is caused by reciprocal influence, i.e. reciprocal multiplication of the following factors: air displacement, formation of eddy currents, vehicle mass, and rolling friction. This means that there is much more potential in reducing eddy currents by introduction of bionic-like car body than it is in complete conversion into hydrogen-based mobility.

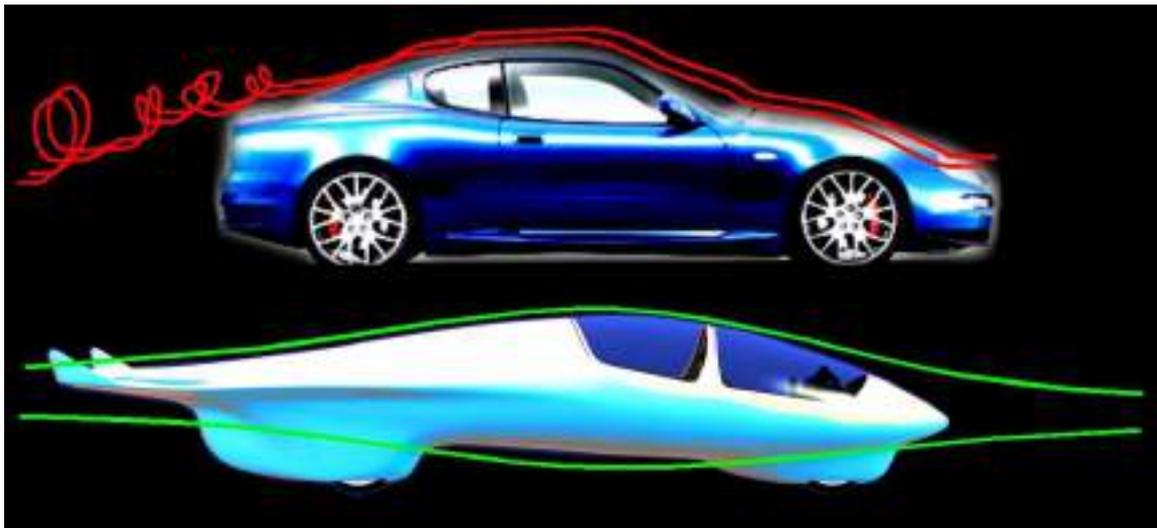


Fig. 37: The future is in consequent and skillful application of bionics

Nature itself shows us the solutions, how it can be protected. We must just start looking. Bionics is not about what is there. It is about what you learn to see.

**The Acabion traffic systems learned to see. Join us, and see it, too.**

**Thank you.**







***"When you're finished changing, you're finished."***

**Benjamin Franklin**





***If you like the Acabion vision, please do not hesitate to send this brochure to colleagues, friends and relatives. It is everybody's right to see what can be done, to see what has to be done, and to see what will be done. Everybody can help. You can help. Inform yourself about the Acabion Vision and help communicating it.***

***The Acabion team by itself will contact important people who should know about the vision and who can contribute.***

***Let us use the power of the Internet and the open community to inform each and everyone, that cars are obsolete. Cars block innovations, that can and will bring a 10 to 25-times brighter and more nature-friendly future. But the blockade time is over. Ask your colleagues, friends and relatives to help making the Acabion Vision everybody's most beloved mobility vision.***

***We do what we do to stop global warming and to stop wasting global resources. We do it to increase stability of this world in a time, where it tends to loose it. We do it for you, and we do it for generations to come.***

***Please find further information at [www.acabion.com](http://www.acabion.com).***

***Thank you.***