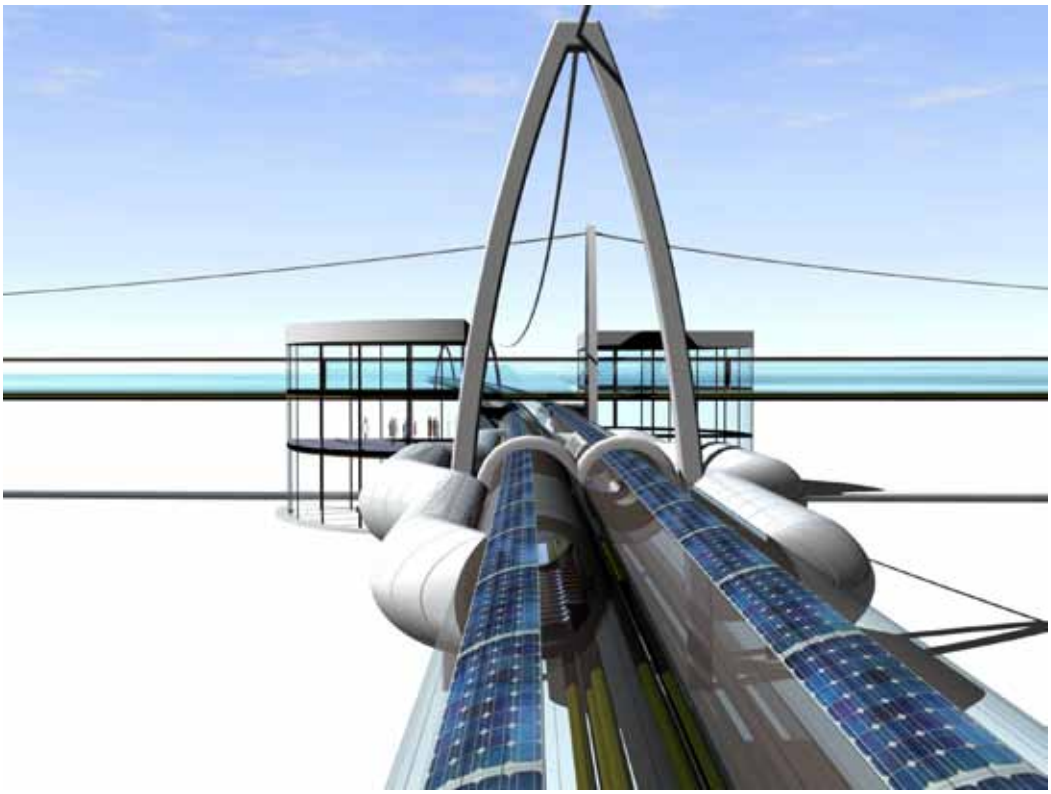

TubeWay solar

Development study of the pressure-difference traffic solution

Forum for Ecofriendly Mobility - Austria

Michael Thalhammer

www.tubeway.de

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Overview and perspectives of communicating mobility in gliding nets

Due to necessary adjustments to resource and energy demands to come, Tube Way represents the ideal form of environmental balance, safety and a lucrative investment for builder-owners and users as well.

Transparent tubes built as elevated tracks over existing terrain are an extending continuation of current traffic systems. Tube Way meets almost all demands of traffic with our self-sufficient mid- and long range concepts.

We define a marketable relief- and supporting network and wish to add it to your protocol as an urgent suggestion for the OPEC, the EU, investors of new venture capital and other competences. It is designed for connection-friendly general public leading transport and freight services and is easy to produce. In September 2007 we developed additional solutions for the technique of propulsion that were fundamentally new to Tube Way.

Imagine future mobility with Tube Way: Even though the tube allows you to cover your short and long ways faster, the ride is completely free of stress. A certain calm and composure has spread everywhere. Smooth mobility is flowing quietly gliding above everything in tubes of glass; and all that service at prices as they were many years ago.

Our viable system of sequenced pressure-difference drives with it's starting and utility areas is a vital alternative to further highways and new subways. It offers public and private passenger and freight transport services- without the risk factors of conventional traffic solutions like accidents, emission toxins, friction, air resistance, overweight and high general costs. Due to increasing fuel costs alternatives are being tested in many places. In order to solve these problems we do without fuel motors and chassis, streets, waste heat and headwind- they are just all gone, leaving only danger free spaces.

Physically our solution proposes shape and power-efficient gliding. Low product weight and collective power of the distributed capsules with front pressure engines and the employment of photovoltaic and/or network electricity distinguish the patented approach of the Tube Way system. Tube Way is independent of weather conditions, working at lowest friction, durable and cheap in maintenance.

Tube Way is gliding without environmental pollution by dust or CO^2 and thus, it is ready to help reducing the world-climate problem and deals with the core-question in traffic: How are we going to saddle which horses for the further advancement of all in the future? It shows the way to accident- and jam-free mobility. It surpasses the motivations so far for car- , railway- and even air travel. In the future many unclean means of transport could find their better equivalents in the extension of Tube Way high-speed networks, which transport passengers and freight in a clean and silent way.

With the sunlight as our source of energy we generate electricity by means of thin-layer photovoltaic modules installed on top of the tubes. They transform daylight into operating energy for our propulsion aggregates. These air-drives move the gliding units at their particular speed levels, controlled by an accurate control system allowing for soft guidance maintaining the full dynamic for the relative speed sequence. Propulsion is achieved by means of streams of air generated by solar power and an integrated system of electro motors and the continuous dynamic mass-swing of all units. Air, solar power and the recycling(!) glass for the long-lasting tubes almost cost nothing. And who has ever heard of a street that lasted for a hundred years without maintenance?

We have developed Tube Way following the concept of tube mail which has been tried and tested since 150 years. Pneumatic dispatch and an innovative inner drive are the new approaches to the concept, which guarantees low risk of turbulences. Tube Way combines pressure and suction pneumatics and uses photovoltaic technology. Now we have a lucrative project plan, whose environmental advantages and efficiency make us hope for a meaningful breakthrough in traffic adaptation. The size of the tubes allow even the transport of cars.

Lasting environmental compatibility and numerous advantages for the operator, the passenger, the transportation customer and the owner of private capsules distinguish the Tube Way system. Furthermore, it is captivating through it's plain design and the cost efficiency typical for integrated system technologies. The accurately coordinated logistic management at the automation supported control centre makes a jam-free, speed graduated just-in-time possible. Communicating tube systems offer a lasting and inexpensive passing lane towards petroleum free mobility. Each turn is managed by a 100% secure central steering. Cabins and capsules glide towards their destinations controlled by a fixed program. Wide-ranging communicative tube systems propose a way to the engagement of patrol free traffic.

This technical approach could bring enormous business advantages in the long term and gives a fresh impetus in the direction of reasonable, feasible mobility concepts for the current century. As far as development is concerned, Tube Way is still a vision; just like the telephone or other innovations, each-of-which have started as a vision before they became devices of every-day use. It could introduce a totally new market with a number of jobs; it could be the answer to the present destructive spiral of an increasingly irrational dependency on fuel-motor cars.

Since centuries the blowpipe(and arrow) used as a hunting weapon supposedly is the earliest example of a pneumatic approach. 150 years ago in New York a sequence of route that was similar to Tube Way has been tested. Unfortunately it failed due to inadequate materials. Today, however, such an enterprise would surely be much more feasible. In addition, our main interest in a long-lasting solution meets the needs of entirely conceptualised future mobility. The wrong assumption is that what is possible as tube mail is impossible in a larger context. This would imply that a small ship would be able to proceed in the water, while a huge one would be stopped by it's enormous suppression. In fact, it is the hermetic starting point that caters for the physical advantage of our approach.

There is no underground or magnetic gliding system that could outweigh the economic advantages of Tube Way. It handles the question whether air should be considered as a helping ghost or as a source of disturbance in a completely different way as it is done in generally known systems. Here it is shown that

what is actually possible through the use of pneuma technique, which is being used as a practical and vital form of future mobility. The vision of endless glass tubes is now opposed to our monstrous streets of asphalt full of stink, noise, the inherent danger and all their immense costs and follow-up costs. Relevance to climate is not dealt with by a simple bargain with emission! The climate change urges for a cleverly reflected revolution in technique- in the shape of a modification of the reasons. We need alternatives to production processes and most of all to traffic and transport.

Let's have a closer look at how, where, why, what for and for whom our technical approach makes sense. The following pages will go in detail about how Tube Way is constructed and how it works. The reason why developing countries will probably be in the process more rapidly (as well as two smaller devices of transport) is to be found towards the end of this study. Along with the sections on security and finances, the comparative links will be of more far-reaching interest.

Seen as a completion system the diversity of means of transport remains advantageous and important.

Technical description - functional principles

For a continuos transport of the ultra-light-weight gliding- units, we use a small difference of pressure inside the pipe which either pulling or pushing the units. In the designing process the leaving out of wheels has turned out to be economical and reasonable regarding energy and internal weight parameters.

Our tracks consist of robust hard glass sandwich tube modules of 2,3mÆ(see p.10). Suspending from route pillars and a main cable using modern tension cable technology, tube elements of 15 metres in length are put together with sliding socket joints allowing stretch tolerance. Thus, wide spanning, vibration free routes are built alongside with flexible lane-detachment units which are 1,5m in length. Two supporting cables, tube compound and pillars guarantee the required traffic safety. The construction, based on bridge building statics, carries a two direction twin tube, the movable gliding units and a media cord at average 7m above ground. Designed for decades of operation, it provides a firm flexibility and weather resistance to the tracks. With a pillar every 40m (up to 200m), the load per pillar will be about 140t track weight plus average 90t consisting of the weight of the movable gliding units and their payload.

The gliding units are gliding to their pre-programmed destinations, propelled by permanent suction/compression air streams inside the tube. These units, designed for up to 13t gross weight, are gliding on channels of stainless steel smooth as glass (1,7m wide), making use of Teflon scale shields attached to their undersides. The design of the shields' surface provides weight distributing single gliding squares guaranteeing an optimum weight of 80g per cm². The underside and the gliding unit are in continuous contact throughout the way. The developing glide-shield warming (much lower than 70°C) is being cooled by the airflow around and between the silicon stripes. The co-efficiency of this gliding friction is at about 0,04 which is much lower than that of steel to steel(0,15).

And now to the engine:

Propulsion capsules, which are driven by solar direct current, function as pneumatic drives which suck and pull in distances of 1-8 kilometers. The forms of the cross sections of the gliding channel and the gliding soles fit exactly into each other, allowing the units to tilt in bends up to a certain degree. The gliding units are kept in balance by four small horizontal wheels. Any rocking movement is limited by these wheels running along the edges of the gliding channels. This device also includes a wireless hydraulic emergency brake system.

Four laterally queer single driving wheels(or Kevlar-supported tyres) transfer speed and power to the stiff upper shields of the pneumatic driving units. The dual use of power inflicts a smooth gliding-process. The transmission between

distant units can be regarded as direct due to one consistent propulsion force on to the front ends of all gliding units. It sucks and pushes the amount of current and revolutions-per-minute accurate for the partial speed section; providing pneumatic power for up to 40 units (or ccc) and maintaining the constant flow of air for the gliding in an optimal-hermetic laminar streaming dynamic. The continuous force of all drives benefits all units and thus provokes the constant swing of the units, which are able to reach independent destinations.

To use the power of the compressible air stream at minimum loss, we use a contact-free brush seal system on the outside of the gliders. Such a multiple gasket system creates air spirals which result in 100% sealing air-rolls. The caulking begins at the front as a semicircle on the lower half of the cabin. It then continues horizontally on both sides towards the back with the second semicircle gasket reaching over the cabin. The sub-pressure which constantly pulls on the cabin's front also levitates the cabin at the upper section, just like the over-pressure at the back pushes and levitates the cabin from underneath, comparable to hovercraft.

The track consists of 5 predefined speed sections which automatically tell the cabins how fast they are supposed to drive. Hence, speed changes are conducted very smoothly. But this also means that in certain parts of the system, cabins drive at different speeds, and further that more or less air is needed at a particular time. This extra air is provided for by small air-chimneys on top of pipes. In order not to waste a surplus of air, it is lead into a Savenius-rotor-aggregate to produce current. Alternating, the surplus air can also be conducted towards the vis-à-vis route of acceleration through diversions. Thus, each speed sequence can physically breathe in and out, also regulating the distances between all units. The flexible and short aggregates each follow a special logistic work diction, being able to change to the opposite direction on terminal loops as well as to stand-by loops.

The forces normally needed for driving upwards in our system are provided by the pneumatics that let the loads glide downwards on the other side. Without difficulty it deals with heights, rivers or valleys and naturally never needs snow chains. In addition, there will hardly be any need for tunnels through mountains. Each gliding unit has stiff rubber joints as bendable floor segment detachers. The gliders made of plane aluminium weigh about 300 to 1400kg, depending on length (3-18m). Long cabins designed for public transport offer folding seats and standing rooms for at least 100 passengers. We suggest inside furnishings made of natural lightweight construction materials. Each cabin is conducted in turbulence-free balance by inertia hydraulics (1-4 pieces). They also hold the remote-controlled hydraulic emergency brakes vertically attached to the gliding soles.

The supply of electricity for the interior use of the gliding units is transmitted by

a contact brush taking current from a flat conductor attached along the inside of the tube. An individual air conditioning regulates the temperature inside the gliding units and the amount of fresh air needed. The air in the cabins is always fresh, streaming through the gliders from the back to the front.

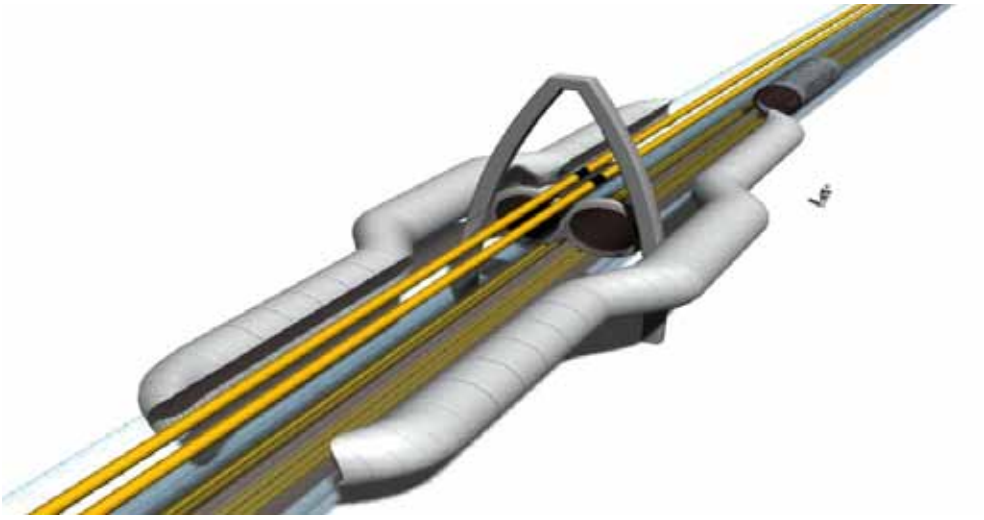
For the starting acceleration, hydraulic thrust devices are used directly in the separated station tubes. The energy for the pushing support in the area of the station is created by the arriving cabins which glide over several flywheel dynamos. Soft rubber wheels on the deepest point cater for the needed energy for the start in advance. Immediately after the station lock, the gliding unit is logistically put in line with the others at about 40km/h and is carried on with it. Start moment, weight and distance of the units towards each other are calculated logistically for each new usage (which also avoids overcharging).

The driving forces are exactly described by the proportions of pressure of moving areas of air separated by the gliding units. The guided stream of air in the tube is transmitted to the swinging load masses as propulsion, drought and speed. This mode of acceleration guarantees a high continuity in transport; and enables the entire traffic to float harmoniously like water in a hose. Due to our only 20% of volume, water in a pipe consumes even more propulsion forces. Our quick-tube-air operates neatly balanced with only 0,04 bar of pressure difference. The relation of pressure and subpressure at the respective speed always remains synchronised, which makes wide-range transport in such a big dimension possible. 5 to 45 units per kilometre of route are the systemic traffic ideal- with increasing efficiency.In towns it would be feasible to comfortably transport up to 48000 passengers per hour and direction (using three lines in one direction).

To assess the needed amount of energy we firstly need the demand for the production of the stream of air, and secondly that needed for a single cabin floating on it. The demand can be calculated by multiplying the square of the tube's cross-section by the speed and the pressure forces needed. Per glider this is an amount between the equation of Hagen-Poiseull and the figure of Reynold.

For the usage of Tube Way an air propulsion difference of 2x 0,02 bar per driving unit is enough. Through alternating drought and propulsion in gliding, optimal technically economic efficiency is established. 0,02 bar are one per cent of the air pressure needed in a car tyre.

If our cabins' front lids with a size of 3,2m² is exposed to only a hundredth of atmosphere (=0,01 kp/cm² or a column of water of 10cm), the cabin in the moving direction is exposed to a force of 3200kp and at a weight of 3t it would be accelerated to over 75km/h in 5 seconds.



Distribution locks are placed before and after stations as wells as at feeders and branching-off points which are shut by sliding doors. A branching-off point is a chamfer bifurcation with a double lock. By shutting off one of the pipes, the cabins follow the directional suction of the open track. Feeders work after the zipper mode by regulating the amount of air as in the stations described afore.

In bends, the mass inertia is minimized as the cabins follow the impetus along with the chamfer. In order to compensate the difference in length and weight of the cabins, in bends the chamfers are broader, that is, more tolerant. Hence, the barycenter is always evenly balanced and therefore driving through bends at constant high speeds is hardly noticeable.

In city areas the maximum speed suggested would be 100 km/h, regionally up to 260 km/h and on inter-city connections up to 380 km/h. These seem to us reasonable and safe tempi.

All public stations can be seen as by-passes to the transportation system as a whole. At such a stopover (which is usually placed above neuralgic traffic nodes) two passenger elevators lift the people to the ground or track level. Dedicated access and exit areas automatically create a rotary passenger flow in the stations: only when a Tubeway cabin arrives in a station will the access – elevator transport the waiting passengers to the departing level, automatically surveilled and controlled by cameras.

Engineering of the Tube Pipe Modules.

The Tubeway pipe-modules are crafted in modified glas-recycling melting furnaces. The chemically hardened glass castings contain for further stabilization horizontal bars in its double wall glass. A third glass coating provides then for the classification as laminated safety glass. The hardness of this hight tech material shows a static stability comparable to ferroconcrete[1]. Any recycling glass can be used for the manufacturing process and the amount of glass in the recycling circle at present would more than suffice for constructing the Tubeway.

And now to the technically reasonable PV-foils:

By covering the pipe-track with 'in-light-active-surfaces' we are able generate power throughout the year. On tracks running North to South, the PV-foil track will follow way of the sun from East to West. At present, Nanosolar® CIGS[2] cells perform best as they are cheap, efficient, easily to cut and adhesive as well as sustainable in production. Even in diffuse light they provide enough solar power for generations to come. During nights or periods of longer overclouding, we reclaim the power which was over-produced during sunnier periods and supplied to the grid. Moreover, the PV-foils which run on separated, slightly elevated tracks above the glass-pipe, provide shade on hotter days. Snow and ice, on the other hand, simply slip from the glass – surface on basis of the temperature difference and supported by the self cleaning lotus-effect nano-film.

Considering the rising energy prices and the amortization of our system, we regard the implementation of a solar-based powering system more than sustainable. It solves a majority of the anachronistic fuel-based energy problems by using only few electric motors. It displaces the weights of chassis or engines, the air drag and also the major cause of risk, that is, the human factor as the individual driver.

Taking into account a comparison of seasonal costs (most prominently ice and snow), Tubeway will also offer the most cost-effective solution. Moreover, as this systems works hermetically shut with gentle pull and pressure, the materials used are exposed only to minimal forces. Thus, the system as a whole is highly hard wearing.

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1 The magazine GEO 6/03 offers an extensive account of new glass applications which nowadays can be found in a variety of modern architecture. Tests show that durability and hardness of such new materials are far beyond our all days perception of glass.

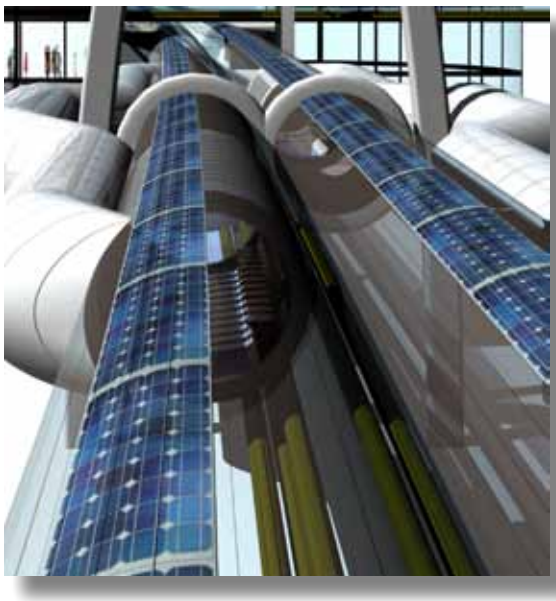
2 "Copper indium gallium (di)selenide (CIGS) is a I-III-VI2 compound semiconductor material composed of copper, indium, gallium, and selenium." (http://en.wikipedia.org/wiki/Copper_indium_gallium_selenide) They are highly energy efficient and available at a tenth of the costs of usual silica cells.

In any case, we consider that a diversity of public means of transport is beneficial for everyone and that the whole public transport system (busses, tramways, rail, subways) needs to be expanded.

Tubeway is capable of conserving our dwindling fossil fuel resources for better means than heating up our climate.

OPERATION SAFETY

As a >moving–net< of the future, the TubeWay is to be directed and supervised sensitively. With a new high standard for safe transport operation it uses modern telematics features such as digital radio transmission and fibre optics, and of course: best trained staff in charge of all areas and structures.



All system functions are to be controlled by trained staff and moreover secured by computers controlling one another, emergency generators and solar batteries. All procedures are to be supervised with a polished failure management.

Only passengers with a valid ‘Bonuscard’ are allowed and able to enter the ‘net’ and move in between their pre-booked destinations. The fees will automatically be debited from the ‘Bonuscard’.

Freight transports, on the other hand, are gliding in the system during the night whereas dangerous goods should still be entrusted to road and railway transportation. Each unit is equipped with a direct intercom, a first–aid kit and a fire extinguisher.
As a further safety measure, the track tubes are equipped with sensors for the detection of pressure anomalies. For every eventuality there are also sound- and motion sensors and closed–circuit televisions at particular points.

The safety programs are working at the logistics centrals under constant supervision. Any slowing down within a section is initiated by the regional safety central and its supervisor. In case of an extraordinary halt, the gliding cabins are detoured and slowed down in designated pipes. Rescue- and/or repairing teams are thus instructed as well as the passengers.

Nearby gliding units and the air stream are diverted by the use of turning back loops and junctions, as not to affect the overall suction/pressure balance and to avoid jams. Units from within the handicap zone are pulled to the next station, where further technical and medical supply is ready. Collisions are nearby impossible for two reasons: Firstly, the safety centre reacts very sensitively on anomalies; secondly, the long air cushions between the gliding units inside the pneumatics system would hinder the units from colliding in the worst case. Even in case of floods, gales or earthquakes, the TubeWay system is comparably safe as its movable socket joints allow a certain oscillation. Emergency exits will be available at the front and rear end of the cabins as well as at every third track pillar.

In case of such an unwanted stop, a detouring algorithm will guide the succeeding cabins in the section around the obstacle, whereas units ahead of a handicap-zone are pneumatically returned to the next station. The transport systems as a whole remains functional.

TubeWay track pillars, that are built next to the ground traffic must even resist heavy collisions and have to be built accordingly massive. Thus even highway overpasses can be realized. Of course a 100% safety is also impossible for the TubeWay system, but its design has less risk factors than air- or railway travel. Also concerning safety the TubeWay means progress.

Administration

For quick booking, each station is equipped with touch screen terminals on which one enters his or her destination and confirms the transaction with the Tubeway-Card. At the destination station the covered distance is reconfirmed again with the card.

Furthermore, TubeWay gliding capsules can be chartered for freight transportation and private usage. Various models for the transportation of bulk goods, liquids, or perishable goods, saloon and office varieties can be realized using the basic design of the TubeWay gliding unit.

At particular stations gliding units are standing by in garages. At these stations gliding units can be lifted on and off the track. In case of demand, an extra capsule can be put in line in the traffic flow, whenever the transport capacity of the air stream allows it. The possibility of parking or employing single gliding units

at almost any time is not only allowing to adapt to the actual traffic situation during scheduled services most accurately, but also offers the option to filter in charter units quickly and flexibly, just in time.

A long capsule offers 2,4t payload at 3t gross weight, respectively space for 7 EU - pallets. Also a motor car up to the size of a minivan would fit into a glider.

Beginning with scheduled services for passenger transportation, the TubeWay can be extended with loading terminals and private feeder tubes.

Business Aspects

The TubeWay system could provide a massive stimulation of our economy. As a new approach to mobility, it demands intense preparatory work and an exact realization, but once established, it offers a wide range of efficient and cheap logistic solutions at low maintenance costs.

It is win- win & ecowin! Its innovative construction is a safe and ecological investment in transportation services for intelligent investors of venture capital. The market follows the best technology to cover demands, while the demand guarantees profits. Reasonable investment does not only create money growth, but also initiates new business fields.

We want that our approach connects communal planning and interested consortiums. The Research programs of the EU and regional authorities will prefer investing in the development of TubeWay. Eco - investment and industry will follow. The TubeWay is meant to be an alternative to expensive extensions and repairs of existing traffic connections that are dependent on fossil resources. It is relief, connection and complement. The TubeWay is a problem solver, who is likely to even profit from oil shocks.

Coordinators for state business guidelines, raise of funds and financial support are wanted now! The competences of communities, environmental groups, media, investment, infrastructure planning offices and manufacturers hold a decisive potential.

We assume that the extension of TubeWay routes costs about 30% less than that of conventional railway lines and that the prices for the usage of the TubeWay would be half of nowadays fees.

A closer investigation on feasibility, cost – benefit ratio, general acceptance and environment compatibility should show, that the TubeWay is a traffic solution with the best perspectives for economical growth, using sustainable ways to deal with resources and the environment. The development of a test route should be an investment that shows great foresightedness concerning traffic problems, environmental risks and economical growth.

REALISTIC CHANCES

One major argument for TubeWay is irreversibility. At last nothing on earth can be undone. Just as not a single drop of burned fuel can be turned back into oil. Strong commercial arguments for TubeWay are highly apparent and the EU, as well as industry and finance will soon seek to implement this system in order to deal with actual and future traffic.

A special incentive for private TubeWay capsules lies in the multitude of possible interior designs, offering far more varieties of usage and equipment than usual cars. Office-, laboratory-, or saloon varieties would open totally new product lines. Private garages and feeder tubes leading to the common network could be built; but also public TubeWay garages could be used to park the private capsule, standing by to enter the network at the push of a button.

After studies and commercial calculation regional transport systems should take the TubeWay into consideration, regarding its structural stimulation and its overall suitability to cope with future traffic demands. Also the difficulties of land transfer should be minimal: The TubeWay is silent, emission free, optically neutral and uses only little space for its track pillars.

Market – Competitors - Strategy

Our system is potentially advantageous for all customers and all transport sectors. It is suitable for conurbations, alpine transit, inter-city travel, freight lines or prestige projects such as in Dubai. The service network of the TubeWay leads over land and roads as direct routes. Investment parameters, together with the incentives of speed, low usage pric-

es and customer identification, sketch intelligent multi purpose mobility.

The TubeWay might provoke a divergence of interests. But the introduction of the system into the transport sector has a good chance to lead the way to a new understanding of regional and transnational traffic.

Also politico-economic considerations recommend the tube, since the automobile industry doesn't seem to be ready and willing to replace conventional engines with f.i. hydrogen drives or other alternatives to fossil fuel motors, while the oil prices are climbing. Service, maintenance, and operation of the TubeWay are less expensive than in conventional traffic varieties and economically it amortizes in the medium term and produces clean profits afterwards.

Organisation - Management – Marketing

If the development goes according to plan, the TubeWay can be realized within 5 to 8 years. It allows for a real increase of the quality of life of residents and saves the environment. As a well developed product, even the prototype could be profitable and lay the foundations for further extensions.

The TubeWay is always a good start!

Advantages

- Low investment costs / fast amortization
- High prestige / high profits
- Eco – marketing advantage: no need for fuel
- Cheaper than conventional traffic
- Operation and maintenance at low expenses
- Just – in – time transportation
- High acceptance / sympathy: low resistance

Exact numbers, values, and technical respectively financial calculations are not subject to this preliminary sketch. The links listed at "annotations" give an overview of the present development of alternative drives and traffic approaches.

Feasibility / efficiency

The capacity of a TubeWay two–direction route is equivalent to a six–lane highway! At the tempo of 300km/h, 3 to 4 driving units would move 130000m3 of air within five minutes and transport up to 4000 passengers or 350t of freight.

Roughly calculated, the TubeWay track will cost about 3,5 mio € per kilometre. The construction of a highway, in comparison, costs about 7,5 mio € per kilometre. The ecological extension of the TubeWay (at fully developed standards) could even be less expensive than railway extensions.

Even pricy land purchases will belong to the past as for one kilometer of track only 400m2 of floor space are required for the stilts. TubeWay leaves the floor untouched to a maximum extend.

The power needed for operation can be generated during daylight at over 100% by photovoltaic cells, if the entire track is covered. Natural regional resources such as wind and water can be used alternatively. During the night we reclaim the redundant power which was produced during the day and supplied to network.

The purchase price of a TubeWay gliding unit would be much lower than that of a comparable motor car due to the simple construction of the glider using far less mechanical parts. Cars have a maximum efficiency of 36%, while the average lies at 22%. An electro motor, in comparison, works at an economical efficiency up to 90%. The assessment parameters are noise level, waste heat, and the kind and the amount of emissions. Also a comparison of the recycling of worn out motor cars and capsules (respectively tubes and roads!) leaves the car far behind.

Individual users should favor the TubeWay system and should get used to it easily: it offers more room, is faster, totally independent from weather, doesn't need fuel, and doesn't need to be steered. A varied assortment of dynamic TubeWay gliders offers individuality and privacy for the customer. To combine the advantages of network traffic and individual traffic, there is the possibility to use a part of the capsule to carry lightweight vehicles.

Public funds and share capital should work together to form a solid base to cover communal demands on the one hand, and to involve economical interests on the other hand. Also EU funding programmes for the reduction of emissions could consider the TubeWay as an option worth supporting. Once a TubeWay system is es-

tablished, it should be independent from public allocations due to its profitability.

Used glass is a cheap raw material, which is made into an environmentally friendly product, a means of transportation with great aesthetic qualities. Furthermore, when built on architrave blocks, Tubeway can be removed as easily as a roller coaster.

Implications / positive side effects

Air pollutant levels, petroleum imports, noise and road accidents will go down. The new network creates new jobs, new professional groups and industry contracts which means upswing and stimulation. Urban living spaces can develop more freely through the use of elevated tracks; long–distance. TubeWay routes don't form barriers for people, animals, or agricultural work.

Three Pipe dimensions would offer the following expansion options: the 2,3m diameter norm for inter-city connections; the 1,4m diameter suffices in inner-city areas and local traffic; and the 04,m diameter for transporting smaller items and goods.

Current developments in technology

At http://faculty.washington.edu/jbs/itrans/photoindex1.htm you will find a collection of over eighty projects (some of them already realized) on alternative traffic means all over the world. Also at www.capsu.org, www.w-4.de/~carbike, www.twike.de und www.bitter.at - and www.solarmobil.net, offer comparable concepts.

Everywhere highly frequented forums are ongoing, and our participation shows genuine perspectives. By virtue of our extraordinary approach the TubeWay turned out to be the master of efficiency in comparison with other new developments so far. Now the willingness to invest venture capital is needed; plus the awareness and the support of states respectively state ministries.

Ecological suitability / Urgency

The energy that is needed for the operation of the TubeWay, electricity, is either created by its own photovoltaic system or provided by a central power plant. Both options will work at a far greater cleanness and efficiency than thousands of single combustion machines using filters and catalytic converters would.

Through the excessive use of the limited resource fossil fuel, the health of our atmosphere and the world peace are threatened. Commonly, the situation is presented as if there was enough oil available, to continue the present extravagant consumption at no higher risk than small increases of fuel prices. In reality it's just a question of some few years that oil prices will explode, threatening our whole idea of life.

Our future prospects should reach farther than maybe a 50 years (of war?). Investors as well as consumers nowadays are not only interested in fast profits which is visible in the growing market trend towards durable energy technologies. These fields are leading towards a better employment situation, an intelligent energy mix, social safety and a good capital flow. That is the interest of conscientious eco–investors: to prolong our right for life on earth.

Vision of the year 2015: Everyone is happy that the age of the obtrusive–dominant, fuel burning road traffic with its malicious dust, emissions, accidents and distress has finally come to an end. The Kyoto – aims are reached and professions worth living offer more to us than creeping around in stinking traffic jams with expensive wheels. The energy mix has paid!

Too optimistic? No, it's not! As quality increases, the employment rates within the related business fields will go up too – as it has always been. Even the decision to develop a project creates a continuous expansion and new values, as the start-ups of the IT sector have shown.

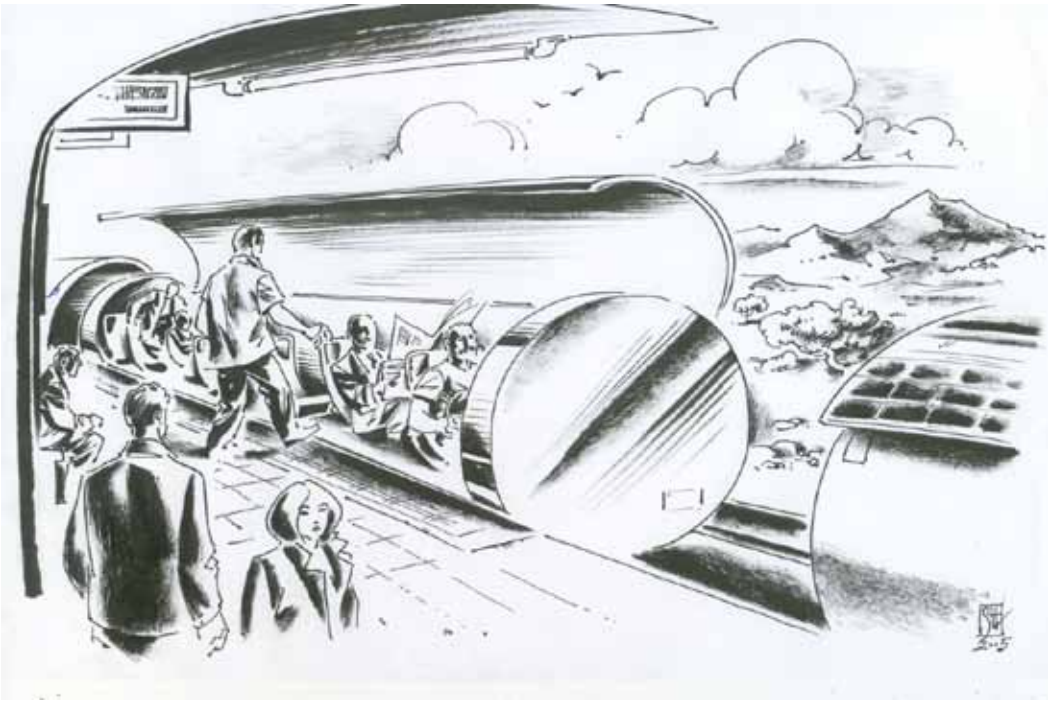
Regions that implement the principle will enjoy considerable advantages on the market in the future. Just a handful of unemployed specialists could develop the plan and the needed facilities for the production of the first series.

The dependency on oil, coal and nuclear power is decisively reduced.

Applications: To begin the development of a TubeWay network (f.i. with a gliding route between a city and an airport) a relatively moderate start–up capital

is needed. The route could then be extended up to a high speed intercity network. Other applications could be: connection between factories and freight terminals; alpine transit route; fairground attraction; municipal supply and disposal tube with 40cm Ø seem reasonable application areas.

Especially in newly industrializing countries our simple system approach could fall on fertile ground. The development of a growing TubeWay network is more likely in emerging regions than in states rich in oil and with rigid infrastructure plans. Perhaps China, the Tiger States, Brazil or India, states of a high flexibility, would show interest to initiate the rise of TubeWay as the pipe system is easily passes the difficulties arising from climate extremes or demanding terrain. A TubeWay–light variety with a diameter of around 1m could carry passengers sitting one behind the other, enjoying a multimedia programme or using a reading lamp built into the back of the seat before them. But also freight would



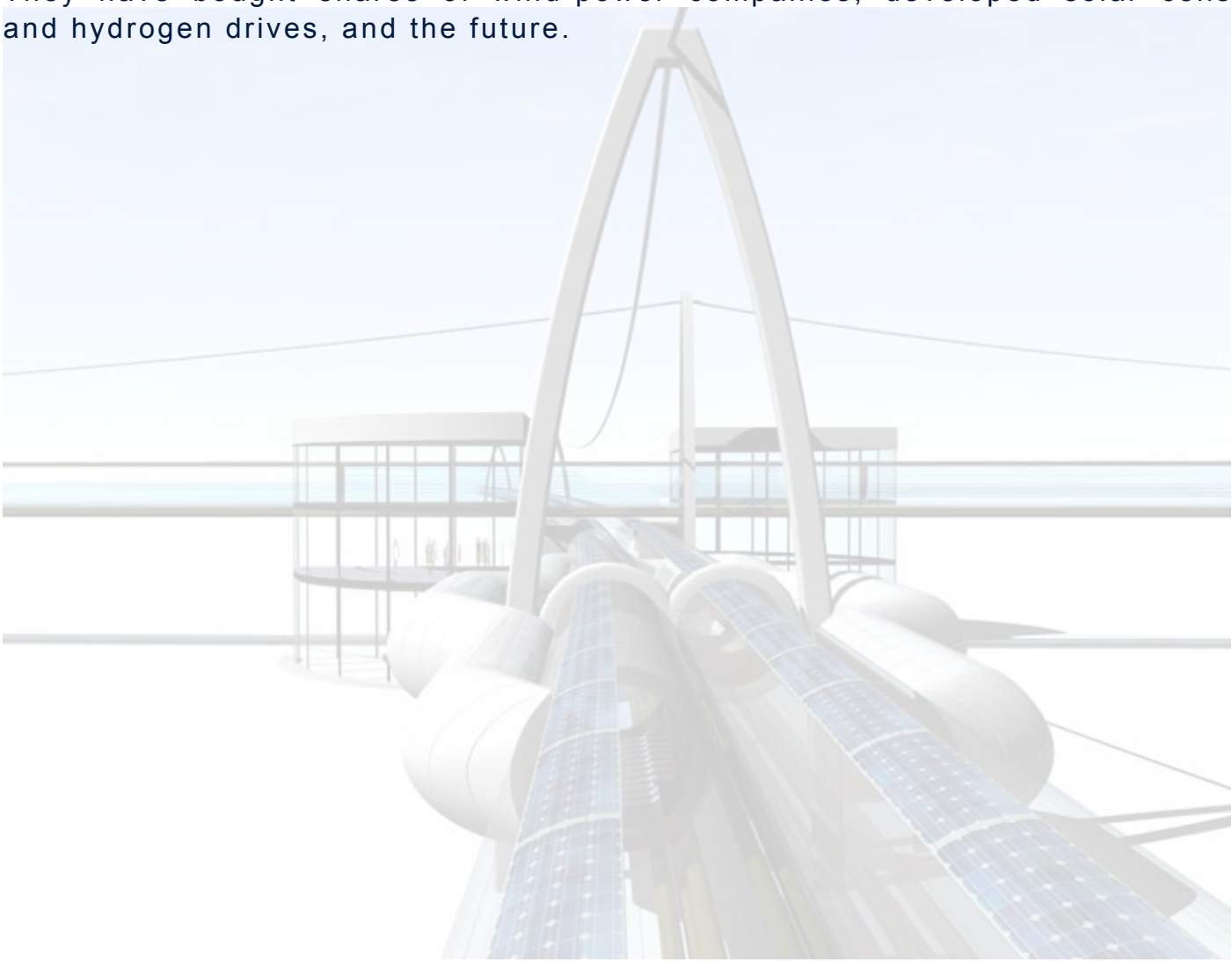
be transported fast, safely and at affordable prices. The small variety should amortize even faster, and thus create a lead in competition soon. This “Sit-in-Surf” variety would cost ~1million € per kilometre. The cost of development of the 1,4m diameter pipe would be around a sixth of the 2,4m diameter pipe.

Our future demands that forests, air, and water are treated with solicitude. So we need determined eco–ethical approaches. To leave the slippery slope of oil dependency, environmental specialist NGO’s, research institutes and the energy giants must cooperate. The big companies do actually know about

the problems of the energy situation and the coming crisis – and they have also got the means, plus a keen interest on their own economical future. So, let's find a way to satisfy both ecological and economical requirements!

The image shows a vision of the "Sit-in-Surf" version of the TubeWay–light variety with a smaller diameter as suggested for emerging regions. This version consumes only a quarter of the energy the 2mØ system needs. Used for the transportation of goods and passengers, it could help poorer communities to keep pace with the worldwide progress, to emancipate from economical dependencies, and could give a fresh impetus to new fair-trade programs.

The members of the OPEC must also be seen as potential interested parties. Their sense of global responsibility, however, has to be claimed for. Actually they represent some of the leading states in world economy, whose interest in the well being of all peoples should be more than pretension on the pretext of "development phases" or "the market". At least, the big energy companies are already investing in alternative energies as a hedge against the oil-crash. They have bought shares of wind-power companies, developed solar cells and hydrogen drives, and the future.



Author, inventor and forum/domain operator.

I am 54 years old and have been interested in ecological technology and future solutions for decades.

I also worked professionally with handicapped and elderly people.
I have three children and I love dancing, painting, meditating, singing and hiking.

Finally, I would like to thank my mother, who always believed in me, as well as everyone who helped me with this project.

m.th.

To solve the problem for ourselves and for the future of our children with creativity, doesn't mean to expect any wonders, still several things can be conjured.

Your mere interest helps elevating the concept over sheer utopia.

Contact

If you have objections or suggestions – or in case you want to support our work, please send a mail to: tw@TubeWay.de or phone: +43 (0)316 32 50 98, >Michael Thalhammer<, Johann-Fux- Gasse 10, A - 8010 Graz.

www.TubeWay.de

Annotations

Zu [1]: The registration number 6946, of the 25.06.2004, is filed at the patent office Vienna. I wish that the contents of this treatise that are not covered by the patent should be treated freely to anyone's desire without quarrelling.

Links: http://faculty.washington.edu/jbs/itrans/photoindex1.htm,
www.capsu.org,
www.w-4.de/~carbike
www.bitter.at
www.sueddeutsches-institut.de
http://newwork-newculture.net
www.twike.de

Visit our forum, at:
http://TubeWay.de.

And the projects
www.sueddeutsches-institut.de.

http://galileo.spaceports.com/~wolfhart
> Druckluftmobil > Manuskript

www.wikipedia.de
(see >Verkehr und Transport, >Rohrpost)

http://www.sonnenseite.com/fp/archiv/Art-Umweltpolitik/3975.php
www.swizzbee.ch
www.solarmobil.net and peter.hagenauer@stmk.gv.at, are worth a glance.
http://lotuswolke.at.md/ , my energy-plus construction method is presented.

The number of registration 6946 can be checked in the office of patents in Vienna since 25.06.2004. I wish a suggestion of such high public importance to be handled freely and accessible for all. The patent is to protect the invention from single taking. The tube diameter has to be seen just as a recommendation. It is dimensioned according to the most shipped goods. Our calculations do not take into account heavier or bulkier freight. Teflon, as the plastic with the highest inertia is very smooth, bio-compatible, highly resistant to heat, acids and pressure. Polytetraflourethylen as the material of the gliding scales can easily be renewed after the very slow rubbing-down process. Friction and resistance are almost inexistent like for speed skaters.