REAL COMFORT
AND SUPERFICIAL COMFORT

ERGONOMICS OPTIMIZES THE CONDITIONS OF HUMAN WELL-BEING
WHAT IS REAL COMFORT AND SUPERFICIAL COMFORT
DISCOMFORT, “SICK” CARRIAGES, FALSE ADVERTISING AND PREJUDICE
A CZECH CARRIAGE FROM 1990 AWARDED A NATIONAL ERGONOMICS PRIZE
IS YET TO BE SURPASSED
EXAMPLES FROM CZECH TRANSPORT
The Academy of Arts, Architecture and Design in Prague trains designers who create public transport interiors (transport design). The lessons are also held in the ergonomics laboratory of the Benešov Museum of Art and Design.

In 2010 the academy organised the first Czech symposium on the public transport comfort, accompanied by extensive proceedings. Students’ works will be presented first.
The academy graduates have produced numerous well-known projects:

- Rostislav Vaněk – orientation system of the Prague Metro
- Jiří Špaňhel – artificial leather seats for the Czech Pendolino train (National Design Award, modifications for other trains – RED DOT award)
- David Karásek and Radek Hegmon – mm-cité furniture for transport terminals (National Design Award)
- Aleš Najbrt – orientation system for the České dráhy company (Czech Rail) and the interiors of the reconstructed carriages of České dráhy (Czech Grand Design award shortlist)

National design and ergonomics awards and the Czech Grand DESIGN are no inferior commercial prizes.
Examples of students’ works

The main Czech problem: simple conversion of carriages with compartments into single-space ones

Aisles remain on the side.

Seats are slightly turned towards the windows, thus preventing direct eye contact.

There are air regulators for the windows so that ventilation does not disturb other passengers.
Examples of students’ works

Another Czech problem: hygienic toilets and business-class toilets

Hygiene dictates the use of seats without having to sit down (body-stabilization features), control of the functions with a foot, possible hanging of clothes and small luggage in comfortable height.

Business class requires toilets of attractive design.
Examples of students’ works
Squat toilets as a hygienic alternative have a tradition even in wealthy European countries and are not a sign of low comfort.
The teaching of design and architecture is based on the subject of ergonomics that is the only one to address the well-being of the people for whom the products are designed.

Ergonomics is a science about a comprehensive interaction between people and the environment.

It defines comfort and discomfort at many physical and mental levels.
Ergonomics defines the conditions of comfort that is really beneficial for people.

However, their creation might be expensive. 

**Commercial producers** offer **superficial comfort** intended for the uneducated public.

It is typified by cheap design and cheap supplementary services.

Superficial comfort is usually cheaper than real comfort. It’s not difficult to work out that the profits of superficial comfort promoted by false advertising are higher than those of real comfort.
Typical examples of superficial comfort

- audiovisual devices disturbing other passengers (passengers’ private AV devices do not optically disturb, with a suitable inclination)
- dark windows that appear effective from the outside
- air conditioning even if it can’t be sufficiently regulated
- seats and interior of kitschy colours
- wifi instead of negotiations with telephone companies about the covering of the rail corridors with signal
- low-quality free refreshment
- installation of broad mirrors that might cause disorientation (side-reversed image) even in standard interiors, let alone in train carriages

DESIGN OF INTERIORS BASED ON PUBLIC OPINION POLLS IS ALSO SUPERFICIAL, AND ALIBISTIC.

ONE EXAMPLE IS THE WRONG SELECTION OF WOODEN SEATS FOR THE ŠKODA FOR CITY TRAMS, WHICH THE MANUFACTURER AND THE CARRIER NOW OPENLY ADMIT.
Uninformed passengers might rely in public transport on a clear identification of comfort in three classes.

Carrier companies use their marketing to blur this classification. The marketing produces misleading names, changes their order and multiplies the number of types of undefined comfort.

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Kritické zóny žalounění sedadla z hlediska tepelných pocitů a rizika otlaků
Optimum conditions for the human organism during transport

- comfortable boarding with luggage into the vehicle
- comfortable movement with luggage inside the vehicle
- seats with armrests and head-rests with side supports
- seats of an ergonomic shape with non-slippery surface of relatively high temperature resistance
- interiors of calming tonality and structure
- possibility of standing up and walking during long journeys
- tonally unlimited view from the windows with seats facing forward, with internal reflections
- position higher above the rail level is psychologically more pleasant for both sitting and standing passengers
- sunshades in the form of curtains or blinds
- regulation of different kinds of direct air flow from the outside, not only for cooling in summer
Optimum conditions for the human organism during transport

- heating in cold weather
- with air conditioning, the possibility and ability of the staff to set it in relation to the external temperature
- suitable lighting for reading and similar activities in the night
- passengers should not be disturbed by machine and audiovisual smog
- interior layout should induce the feeling of safety and privacy
- transport information should not disturb passengers
- toilets with hygienic pedal operation
- toilets with stabilization features when standing up
- toilets with self-lifting seats open in the front section
OBSERVATION OF MOVEMENT LOWERS THE RISK OF FEELING SICK AND SUPPORTS THE ADAPTATION TO A NEW ENVIRONMENT.

VIEW FROM THE WINDOW IS STILL THE BEST ENTERTAINMENT WHEN TRAVELLING.

INCONSPICUOUS ENTERTAINMENT IS THE MOST CONSIDERATE ENTERTAINMENT.

SLEEP IS THE MOST USEFUL ENTERTAINMENT WHEN TRAVELLING.

WORK ON A NOTEBOOK SHORTENS TRAVELLING TIME.
Quality, functional information features for passengers might be only produced with the knowledge of the colour and shape information code (ISO 3864)

with the knowledge of international standards for communication with symbols (ISO 7001, 4196 and others)

with the knowledge of the non-unified colour orientation code

with the knowledge of legibility principles

legible LESS LEGIBLE

with the knowledge of typography rules

with visual responsiveness to graphic design styles

with the knowledge of the auxiliary colour code for sorting out waste
In the design of public transport interiors it is necessary, and part of the professional ethics, to respect the **standard about comfort quality** (EN ČSN 13816).

In the Czech Republic, this requirement is observed by the Regional Organiser of Prague Integrated Transport (ROPID), and not observed by České dráhy.

Comfort quality is also influenced by the **standard of the professional codex of carriers** that addresses all practical connections between the management, employees and passengers.
In 2005, a **model codex of passenger rights** in European public transport that formulates optimum solutions to topical problems came into existence through a discussion between European specialists. Individual carrier companies more or less approach the optimum level.

Here is a sample from the codex:

- **Right to protection against tobacco addicts** from the moment of entering the station until departure.
- **Right to information about the hour of the last disinfection** of public transport toilets.
- **If a carrier fails to comply with any of the conditions of the given class of comfort**, the passenger has the right to be refunded the difference of fare between the relevant classes.
The problem of sick buildings is well known, but there are also **sick carriages**.

The existence of sick buildings was contributed to, in particular, by wrong materials and technological innovations. Although they represent **general discomfort**, most problems concern the microclimate of interiors.

The situation is similar with sick carriages. Their main drawback is the creation of a low-quality microclimate in their interiors and the impossibility of its improvement by passengers opening the windows.

**TRY SELLING FAST CARS WITHOUT THE POSSIBILITY OF OPENING THEIR WINDOWS, WITHOUT AIR CONDITIONING THAT CAN BE REGULATED TO THE MAXIMUM AND WITH WEIRD UPHOLSTERY PATTERNS SEEN IN SOME TRAINS.**
Characteristics of sick carriages

- dark glass with a depressive effect when the sky is overcast
- window glass producing strong internal reflections that hinder, for example, the view out after dark
- no curtains or blinds shading from the sun
- no ventilation vents in the windows
- air conditioning without external sensors and a correct programme for temperature setting
- local air conditioning vents can’t be regulated and can’t be turned off to zero
- air conditioning and other technologies disturb passengers with noise and machine smog
• air conditioning system is not disinfected and spreads bacteria, including legionella, to the interior
• air conditioning system is disinfected and spreads chemical disinfectants to the interior
• interiors contain materials exuding sensorically perceptible and imperceptible vapours
• harmonious, calming colours and shapes are not used
• head-rests have no side panels for the support of the head in sleep
• audiovisual smog, entertainment and advertising are imposed on passengers
• features in contact with the human body have low heat resistance
• toilets do not support the necessary hygiene,
Air conditioning is not necessary for people from that particular latitude.

On the contrary, it’s harmful as it decreases our thermoregulation ability.

**IT’S A TRAP: THE MORE YOU USE AIR CONDITIONING, THE MORE YOU GET**

The same subjective effect of coolness as the energetically demanding and hygienically problematic cooling of air can be achieved by the low-energy increase of its circulation speed.

The amended act of the Czech government on air conditioning cancelled the possibility of adjusting its setting on the basis of an agreement of the people present as it might harm those of poor health. This regulation concerns the workplace, and thus also applies to all premises with a staff that are open to the public.
The most frequent prejudice (the truth is sometimes surprising, sometimes unpleasant)

- Czechs prefer train compartments (based on the traditional construction of stagecoaches).

- Some Czechs prefer train compartments when they can have them to themselves. They can then lie down across the seats, which is why the armrests in the compartments are constantly lifted.

- Air conditioning is a necessary standard.

- Air conditioning is not necessary in mild climates, on the contrary, it’s harmful for people’s health with its negative side effects and bad regulation. It is a civilization error abused by advertising that makes production more costly, complicates usage and increases energy consumption.

- Dark glass in the windows without curtains shades from the sun.

- If it did, you could hardly see outside, especially in the evening. Dark glass with the overcast sky might have a depressive effect on some sensitive passengers.
The most frequent prejudice (the truth is sometimes surprising, sometimes unpleasant)

- All people sit when using toilets on the train.
- According to a recent survey, women (with the exception of the lowest social classes) do not sit at all and only about 50% of men do.
- The others strive to keep their balance without stabilization features (supports) in unpleasant positions.
- Opening the windows is unacceptable with speeds over 100 kph.
- The higher the speed, the smaller the need to open the window, if the degree of opening can be adjusted. For safety reasons, the opening of the windows can be restricted by their construction. Some people open the windows in cars with speeds over 150 kph.
- Advertising doesn’t make the journey unpleasant.
- It must be limited, in a suitable distance and silent.
The most frequent prejudice (the truth is sometimes surprising, sometimes unpleasant)

- The majority of people agree that AV entertainment is the best way of passing the time when travelling.

- The truth is that commercial pressures make people look for entertainment everywhere, all the time. Sociologists believe that the wide choice of entertainment makes it more and more boring. The more there is of something, the less attractive it is. AV devices are now a standard part of travelling equipment; everybody prefers their own music or films to a universal selection. And there are many more attractive forms of entertainment on a journey, including having a rest. Among educated people whose numbers are increasing, an interest in natural ways of perception is on the rise (talking to other passengers, reading books, watching the countryside); it is an effective instrument against digital dementia.

- The ban on smoking restricts people’s freedom.

- The majority of smokers are addicted to nicotine and as such are not free. They smoke every cigarette not out of their free will but because they are forced by their addiction, when the level of nicotine in their blood drops and they experience highly negative feelings. The only ban on smoking that is restricting is the ban in places where smoking would not disturb anybody.
The most frequent prejudice (the truth is sometimes surprising, sometimes unpleasant)

- Smoking can be banned on trains without problems, even on long journeys.

- There are very unpleasant withdrawal symptoms that often make smokers smoke on toilets. A good solution without a negative impact on other passengers would be a small smoking room, but only for electronic cigarettes that don’t stink and quickly increase the level of nicotine in the blood.

- Czech don’t mind people smoking on platforms.

- This is an illusion, Czechs just can’t exert their rights and think that smokers would respond aggressively. Psychologists have discovered that the majority of non-smokers resist smoking not for its negative health effects but because cigarettes stink. Some even say that cigarette smoke smells worse than faeces.

A SINGLE CIGARETTE CAN MAKE THE AIR BAD FOR OVER A HUNDRED PEOPLE.
Special parts of carriages

It is better to design parts of trains for a certain purpose or a certain kind of passengers (mothers with children, single women, quiet zones) than to modify the whole train design. In public transport there are more and more problems with difficult citizens that bother other passengers. Research shows that these people would happily accept travelling in the third class. However, carriers oppose the idea as they would then have to lower the fare. Many of them do operate with third class interiors but refuse to admit it. A compromise would be the establishment of a special “noisy” zone to which difficult citizens could be sent during the journey in order not to disturb.
Example of quality
the best Czech railway carriage in 1990-2010

Made in 1990 in the Vagónka Studénka factory.
It’s still unmatched for its set of qualities.

The České dráhy company (investor) received the National Ergonomics Award for the carriage in 2010.
Characteristics of its benefits

- external door handles of a special shape
- additional handles below ceilings on the end platforms of the carriage
- One of the end platforms is expanded for bicycles, prams and large suitcases
- end platforms with safety colour features
- doors between carriages can be fixed, enabling passing with luggage
- designer toilets
- toilets with self-lifting seats open in the front section
- toilets with full hygienic control by means of trouble-free leg pedals
- Carriages consist of two large sections
- Local lighting switches
- Adjustable opening of the windows
- Interiors in calming cream and brown colours
- Large-capacity tipping litter bins under tables
- Comfortable seats, collapsible in order to make space for prams, wheelchairs and cleaning
- Headrests with shaped side supports for sleeping
- Armrests can be lifted
- Upholstery combines a fabric with low heat conductivity and durable artificial leather
- Carriages have ventilation and heating systems, not needless cooling air conditioning
Good and bad solutions in Czech transport

It is well known that development does not always aim at a higher quality. This is natural, and it is prevented by efforts at maximum profits, by unskilled designers and low-quality carriers, low demands of the public, various fads and other factors.

- For example, in the City Elephant carriages lifting armrests were innovated after several years of production: their originally rounded end was made pointed, and they now pose a danger, in various positions, for the eyes of running children.

- The development of the equipment of Czech sleeping carriages is clearly obsolete. The original non-cooling ventilation and heating were replaced, in the new carriages, with cooling air conditioning without the possibility of regulating it in the compartments and with limited regulation in the control room. Windows can no longer be opened, which prevents natural airing when needed. In addition, air conditioning produces a noise smog which is bad for sleeping.

- The set of quality features from the carriage awarded the ergonomics prize was not repeated in the following products, from the boarding space through seats to toilets.
● Waiting for simple, cheap solutions to ordinary problems sometimes takes ages.

For example, in the City Elephant carriages memory chips were only installed in the door-opening buttons after seven years of production, windows that can be opened were only reintroduced after a long period of time, and the much criticised colour upholstery of the seats has yet to be replaced with a quality design of Studio Najbrt. Generally speaking, these expensive trains contain a number of wrong solutions, for example, in contrast to two-storey German carriages, their luggage shelves are at a wrong height and passengers may hit their heads on them. The shelf edges are not rounded or made softer with plastic.

When observing the activities of the České dráhy state company in the area of design quality, one can see that this enormous carrier company does not employ a single expert that could check the quality of orders and deliveries, nor is it able to set up an external committee for this purpose. This is why we so often encounter unprofessional, amateur solutions.

● The most frequent problems that might damage intervertebral discs
- narrow entrance doors and steep boarding that make it difficult to carry heavy luggage
- entrance doors and doors between carriages that are hard to open
- narrow aisles not enabling passing with luggage (derived from carriages with small compartments).
Examples of good solutions

- REGIONOVA trains created by the reconstruction of small electric multiple units have windows that can be opened to several positions, interiors of suitable colours, and show that a small low-storey section is sufficient, as the majority of passengers prefer to sit safely high.

- Radim Jančura’s fast trains were also reconstructed, and the owner fortunately did not follow the České dráhy’s motto of “no artificial leather”. Artificial leather in not inferior, and the Regiojet train interiors are in good taste including simple, clean toilets, without improving the toilet seats but with vases for flowers.

- Good examples also include the conversion of four-axe carriages of electric multiple units in north-eastern Bohemia into trains with a first class section in express trains, adjustable windows, pleasant interiors, power points in the second class and without needless air conditioning.
Travel comfort is also connected with the arrival at the station

Czech stations with their bad tradition do not respect the necessity of arriving from both sides of the trackage and make passengers cross the rails, which could be dangerous. Expensive solutions like underpasses and flyovers are not the only ones. Cheap level crossings with gates are also possible.

The Central Station in Prague is among the worst examples. České dráhy rejected a useful design for a simple pedestrian connection with Vinohradská třída Street. There is a connection with the Žižkov quarter, but it can’t be used officially. The main entrance to the station is connected with the busiest tram stop nearby by an awkward indirect link; instead, passengers have made their own path in the grass. The city administration contributes to this misery by refusing to clear the snow from the entrance paths in winter and closes them instead.
Arrival at the platform

● In the Czech environment, **belts and handles for prams, bikes and luggage on wheels** are missing in terminal escalators, although they are simple and durable elements without the necessity of maintenance and energy costs.

● **Czech “specialities”**: the lighting of staircases, especially those with escalators, should be more intense than the lighting of corridors, but the Central Station platform administration responds to criticism from specialists with irritation, and would prefer taking the matter to court rather than simply improving the lighting system.
Thank you for your attention. 
For questions and consultations please go to 
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