

# STELLA ORIENTIS



## HIGH-SPEED INTERCITY PASSENGER RAIL CARRIAGES FOR MÁV

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DLA THESIS

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## SUMMARY

### High-speed intercity passenger rail carriages for MÁV

My Doctoral dissertation examines the possibilities of design in relation to long-distance rail transport in Hungary, and on which foundations it can be placed in the future.

I will present the environmental problems of global climate change, and why this became the focus of EU policy as well as how a transport system for the continent can be ecologically sustainable. This research also discusses the history of Hungarian transport manufacturing over the last century, the transformation of the domestic vehicle industry after the regime change and domestic innovation. Vehicle design is equally as important especially when targeting a revival of Hungarian railway manufacturing, its impact and the opportunities that are available when considering large production output.

In the autumn of 2011, I joined Hungarian State Railways (MÁV) passenger rail carriage department as a designer in the development and production of two prototype carriages in regard to technological, ergonomic and user-friendly requirements. The carriage was presented at the Berlin InnoTrans Trade Fair, September 2014. My Doctoral work is based on the InterCity Plus (IC+), and its further development, consisting of a four carriage train (economy, smart, premium coaches, as well as a control car) called Stella Orientis meaning Eastern Star. The assembly and energy efficient technologies can be manufactured in Hungary, however, European standards will be met and within a few years the aging intercity rail coaches replaced.

## Antecedent

During the planning of the IC+ passenger carriage it has been suggested, based on my doctoral researches, that the extension of the IC+ carriage could give a suitable answer to the challenges of the domestic long-distance traffic. The train called Stella Orientis has different carriages with alternative layouts, service and quality level in the interior and lives up to all of my design expectations, and at the same time gives an answer to wide-ranging social, environmental problems.

## Project target

I set two separate aims with my doctoral thesis, and both are manifested and merged in the masterpiece.

At first I looked for evidences that the environmental changes in the last century are in close connection with human activity. I took into consideration how it was affected by human mobility and the externalities of transportation. I was searching for traffic methods that are capable of solving in a short time frame the problems of the growing population and increasing environmental loads.

On the other hand I examined the story of the Hungarian vehicle industry and I looked for answers for the mission and responsibility of industrial design, and the possible breakout points of the railway sector whether it means fulfilling the demands of modernisation of domestic transport systems, or our international obligations in connection with the global climate change.

Summing up the theoretical results I created a railway vehicle which shows the potential of the Hungarian industrial circumstances.

## Conclusions

### 1. Railway against the climate change

The traffic sector makes up roughly the quarter of the global energy consumption. Because our vehicles use mostly fossil fuel it results in a bigger proportion of environmental pollution and greenhouse-gas emission, which is the primer involving factor of the climate change.

On the bases of my research I concluded that the realization of sustainability has the foremost importance. The preference of fixed-rail community traffic is the most sufficient way to reach this goal. The railroad is beneficial both from an energetic viewpoint and its external effects regarding the small rolling friction and air-resistance. The energy sources can be diversified through electric-network and also break-energy can be easily reused. The railway-traffic has low safety risk. **Because of the Hungarian infrastructural conditions and historical traditions the railroad has become the leading force of sustainable long-distance traffic. The public transport and intermodal traffic solutions will promote the emergence of a better, more socially sensitive society.**

### 2. Let's construct the Hungarian Rail-jet!

The story of the Hungarian railway vehicle production has considerable innovations also in an international scale. The relatively high density railway network holds remarkable potential, but it also means risk, responsibility, duty for the MÁV. The development of domestic rail vehicle production must be based on the internal market demands, but it shouldn't forget about the possibility of international markets. My analysis and strategies of MÁV justify that the long-distance train service segment has a great potential in the development. The increase of passenger-number can be reached with the help of system-based problem solving and comprehensive qualitative changes. **A number of foreign country examples prove that in the long-distance transportation segment a train can be successful with powerful branding, complex services and professional exterior and interior design.**

The aim of my masterpiece "Stella Orientis" is to show the possibility of the further development of the IC+ carriage with the help of multi-functional layouts (economy, smart, premium coaches, as well as a control car). Short train of 4-8 carriages with 200-800 km of operational radius can be produced in Hungary.

### 3. Cultural mission – design as additional value

Between the global economic field and the strict international standards can be determined the role of the Hungarian railway vehicle production and its technological opportunities. The ticket sales justify that the interior design, the colour scheme and increasing feeling of comfort generates significantly the passenger numbers. Design is an investment that can be justified with indicators of return, while it is

also a cultural mission. The appearance of the carriages has a great influence on the public spaces, has an impact on the general cultural level and is an important part of country-image.

**That's why I feel it extremely important that in my masterpiece I have to give not merely rational answers to the above mentioned problems, but to create an emotional impression by fresh, cheerful mood, consequent, regardful design-language.**



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