PROSPECTS FOR HIGH SPEED RAIL IN THE DANUBE REGION

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Introductory Words

The basis of this presentation is the TER High-Speed Master Plan Study, Phase 1, elaborated 2016 – 2017, which comprises, on 160 pages (+ Annexes), the following main chapters:

1. **Introduction and historical background,**
2. **Benefits, political background, best practice and high-speed status,**
3. **Review of related work, initiatives, policies and studies,**
4. **Methodology and data,**
5. **Results, assessment, conclusions and recommendations,**
6. **Register of literature, figures and tables.**

After a short methodological overview, this presentation focuses on the results of the study for the Danube Region.

These results are rough estimates showing for which links of the railway network in future decades high-speed could be an option, if economic growth continues as it does presently.

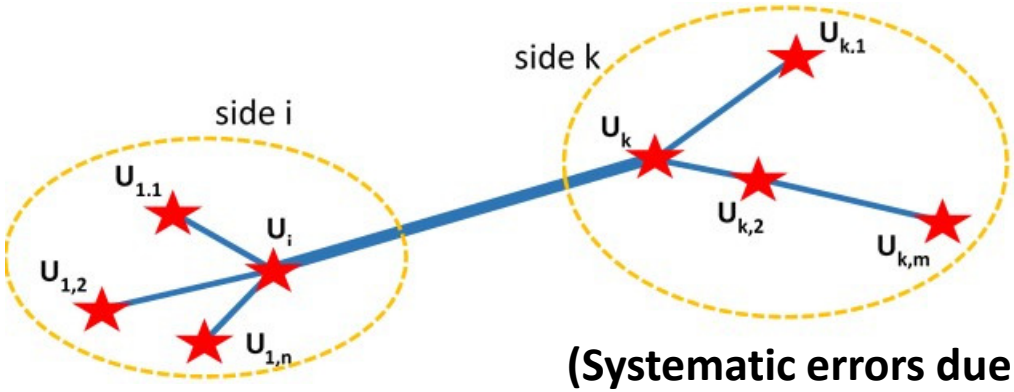
These results do not replace a thorough detail cost-benefit investigation.

Methodology (1)

The methodology was chosen to overcome the lack of data, because – despite repeated requests – only few countries had delivered the input data as needed:

Gravitation approach to calculate the traffic demand potential of every link U_i – U_k on base of number of inhabitants and beeline distances, taking into account for every section U_i and U_k, also each potentially relevant functionality as connection between nodes (city clusters) „beyond" U_i and U_k, according to the formula:

$$P_{i\text{-}k} = \frac{U_i \cdot U_k}{D_{i\text{-}k}^{1.7}} + \sum \frac{U_{i,\nu} \cdot U_{k,\mu}}{D_{i,\nu\text{-}k,\mu}^{1.7}}, \quad \text{where } \mu = 1 \rightarrow n \text{ and } \nu = 1 \rightarrow m.$$



U_i and U_k: inhabitants of i and k,
Di-k: beeline distance i – k (or along polygon).

(Systematic errors due to neglecting peripheries of nodes and detours of links tend to compensate each other.)

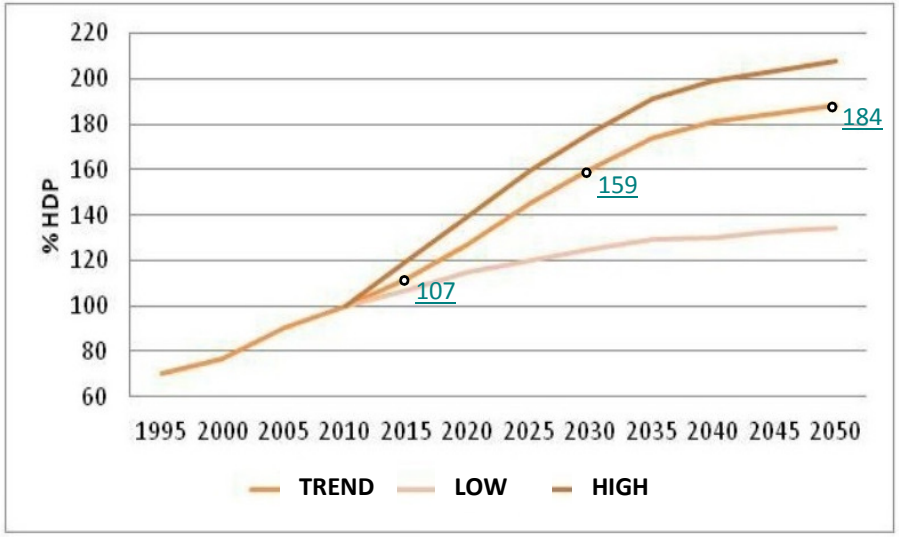
Methodology (2)

The results of the gravity approach do not allow for particularities of individual links, due to different economic situation (and mobility) in the different countries.

Assuming that mobility (and traffic demand) would increase with growing economy, this was compensated in a second step, by a factor GDP per capita of each country referred to corresponding EU average.
This was followed by an extrapolation into future, in line with a long-term forecast as received from CZ.

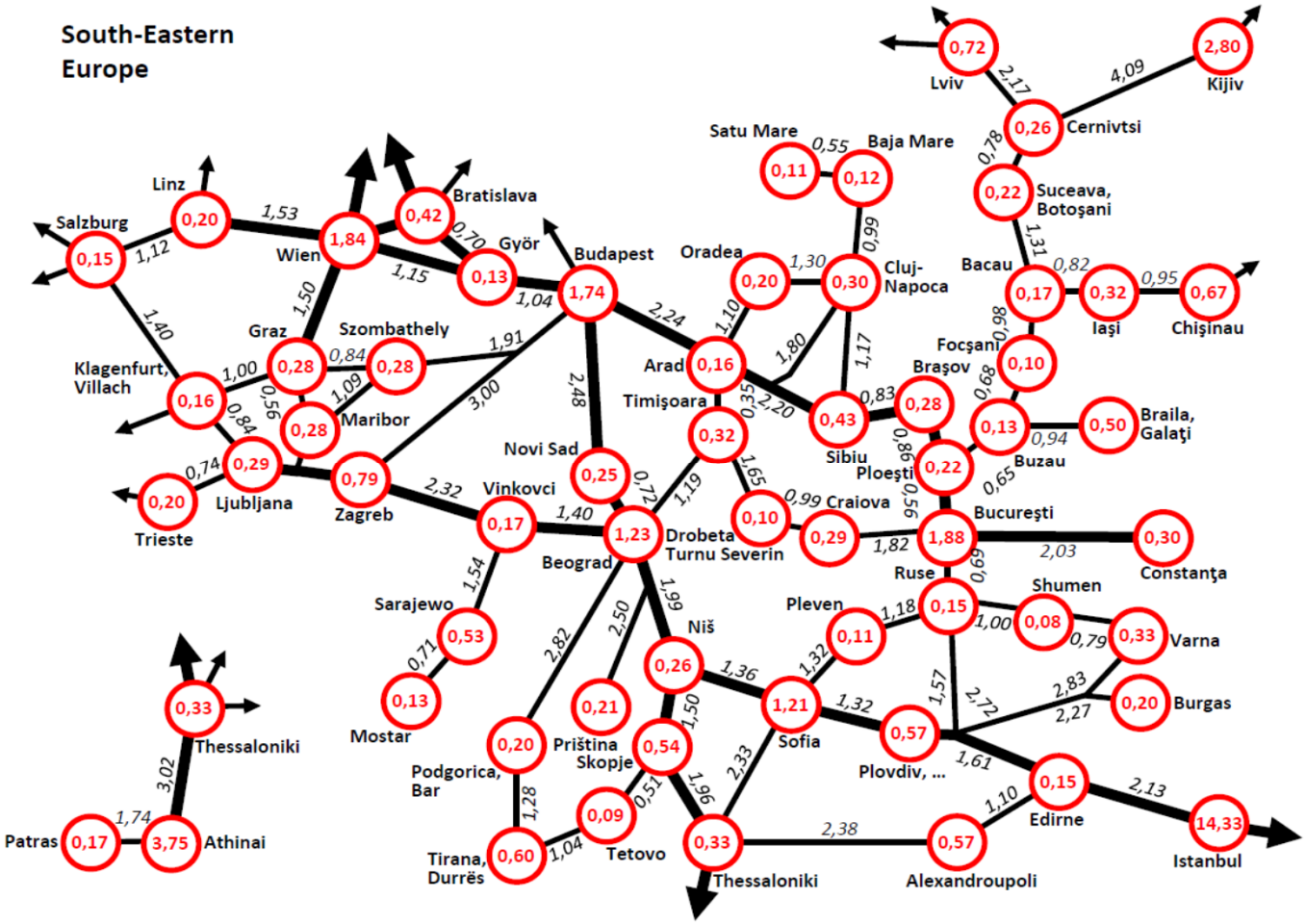
The results were „weighted traffic demand potential" coefficients.

The was done for links in TER countries and for existing high-speed links in „western" EU countries.



When „weighted traffic demand potentials" in TER countries reach those of existing high-speed links, it is assumed that high-speed could be an option also there.

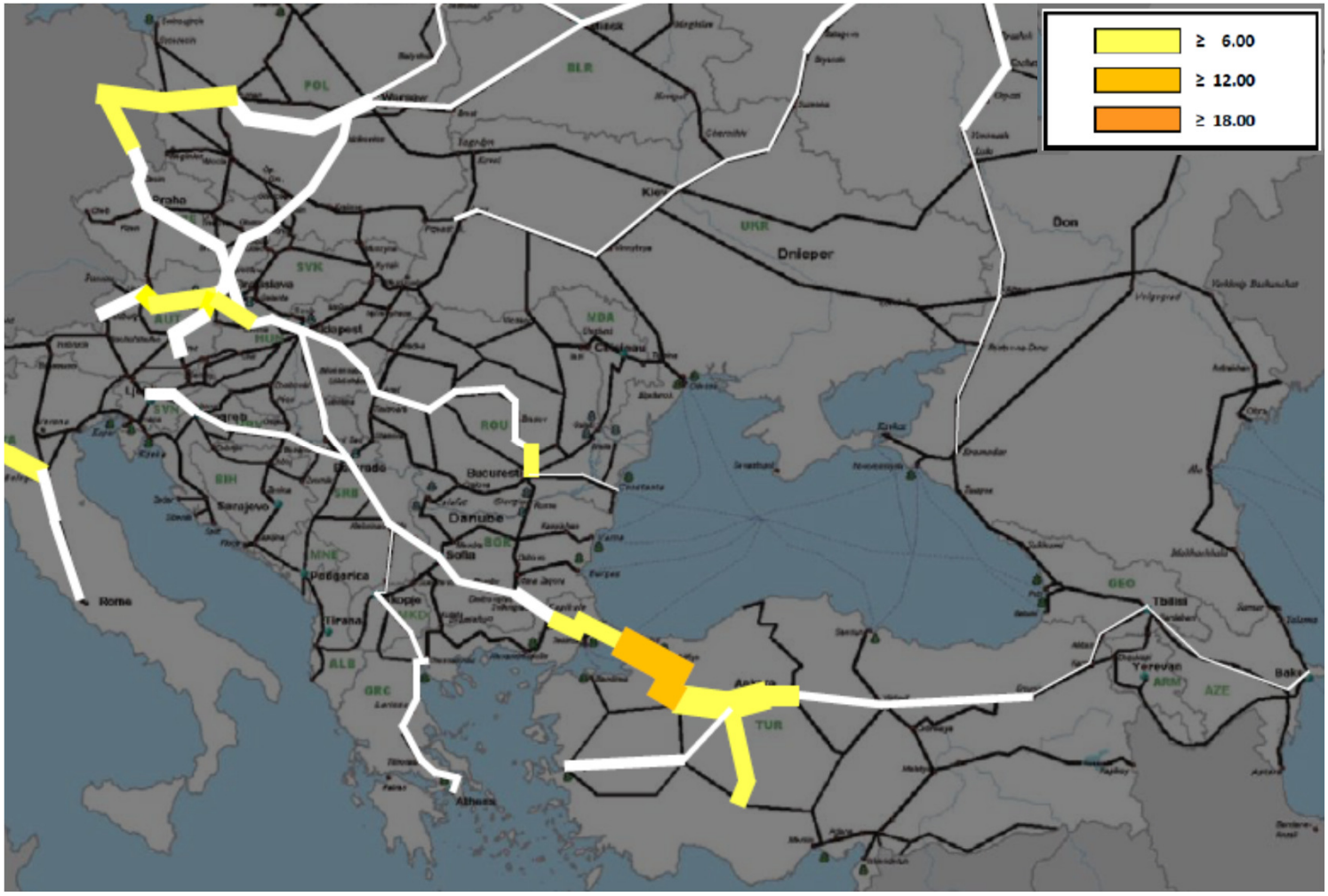
Nodes and links in the Danube Region (except CZ and SK)



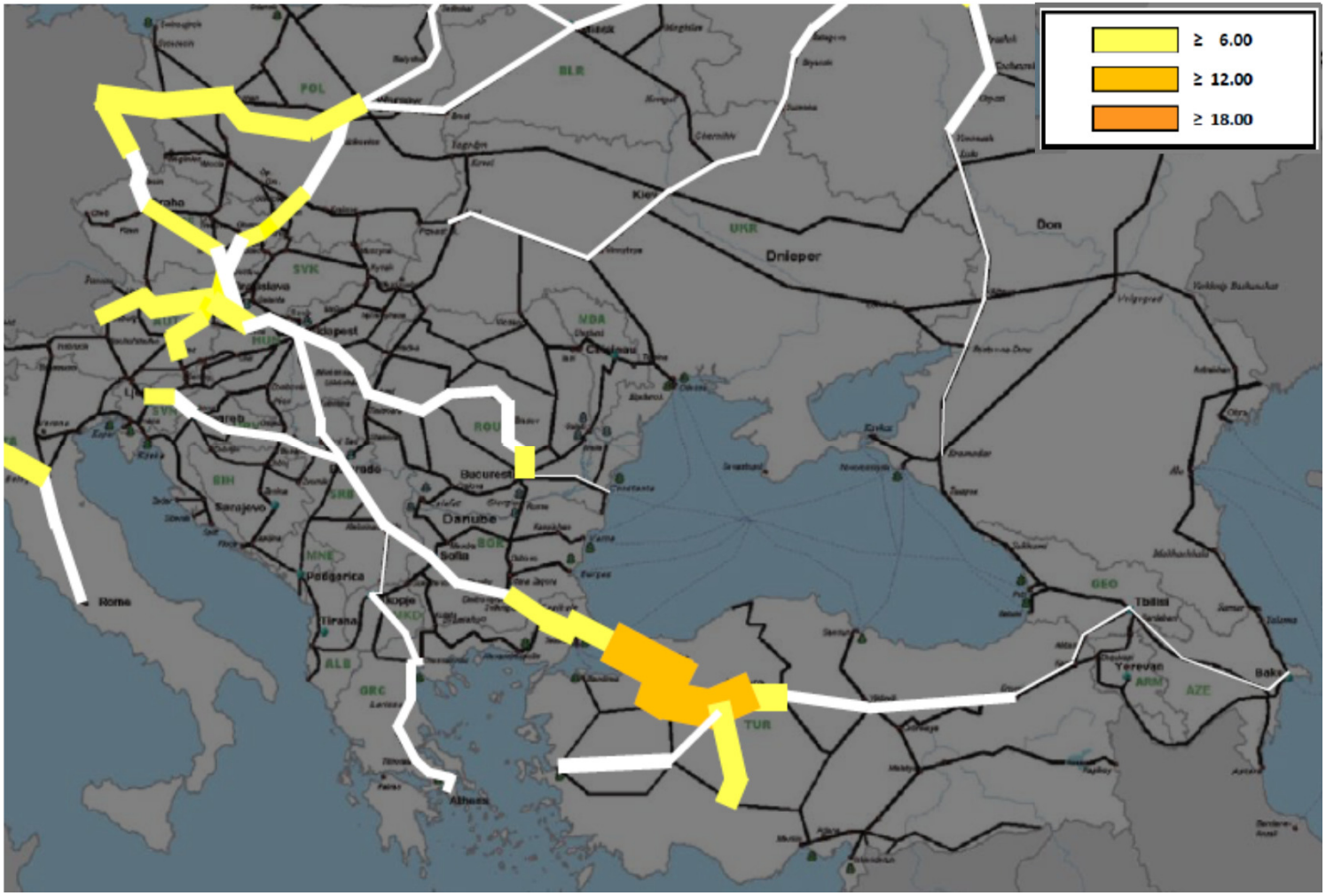
Nodes:
inhabitants in million persons

Distances:
in 100 km units

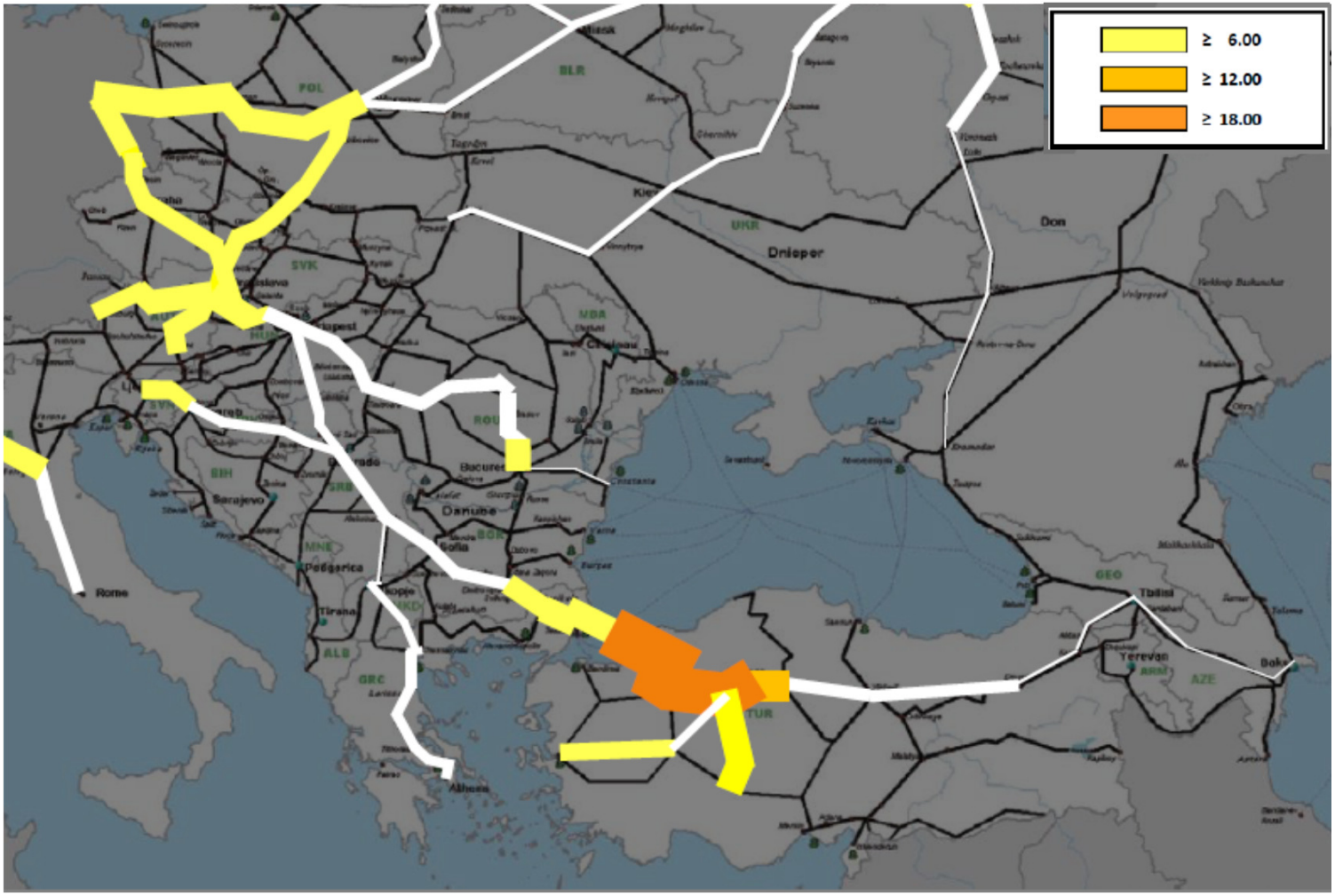
„Weighted traffic demand potentials" 2016 (EUSDR, Black Sea)



„Weighted traffic demand potentials" 2030 (EUSDR, Black Sea)



„Weighted traffic demand potentials" 2050 (EUSDR, Black Sea)



Conclusions for the EUSDR Region

As from 2030, the results show high potential for high-speed rail:

- **in NW parts of EUSDR region (Prague/Munich – Vienna – Bratislava – Budapest),**
- **in the Ljubljana – Zagreb and the Ploeşti – Bucharest sections**
- **and along former Corridor X approaching Turkey.**

With only average population density in the background,
but mainly due to weak economy (=> low traffic demand, difficult funding!),
there seems to be low potential (high costs vs. low benefits) for high-speed rail

- **south of Budapest and in the Western Balkans.**

But this may change with enhanced economic growth after EU accession.

Additional impulses may also be expected from:

- **former „Corridor X" becoming a TEN-T core network corridor (2030?),**
- **Chinese investments in the Budapest – Belgrade (– Skopje – Thessaloniki?) line.**

Against this background, „high-speed" should be re-defined for this area,
with speeds in the order of only 160 – 200 km/h,
but with focus on an attractive integrated timetable and with no delays at borders!

THANK YOU FOR YOUR KIND ATTENTION !

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