Eusair Multimodal Transport Model

Baseline Sceario
Assumptions and Results

16th Meeting of the Thematic Steering Group for
Pillar 2 – Connecting the Region
(TRANSPORT sub-group)

CONTENT

1. Overview of the modelling approach and assumptions
- ➢ Modelling approach
- ➢ Socioeconomic assumptions

2. Key results for the base year (2017) and baseline scenarios (2030, 2040)
- ➢ Passenger transport
- ➢ Freight transport

3. Summary of the key outcomes

# MODELLING APPROACH FOR THE FUTURE SCENARIOS

Modal split model

For any Origin-Destination (OD) estimation of total demand flows by modes (e.g. Car, Rail, …)
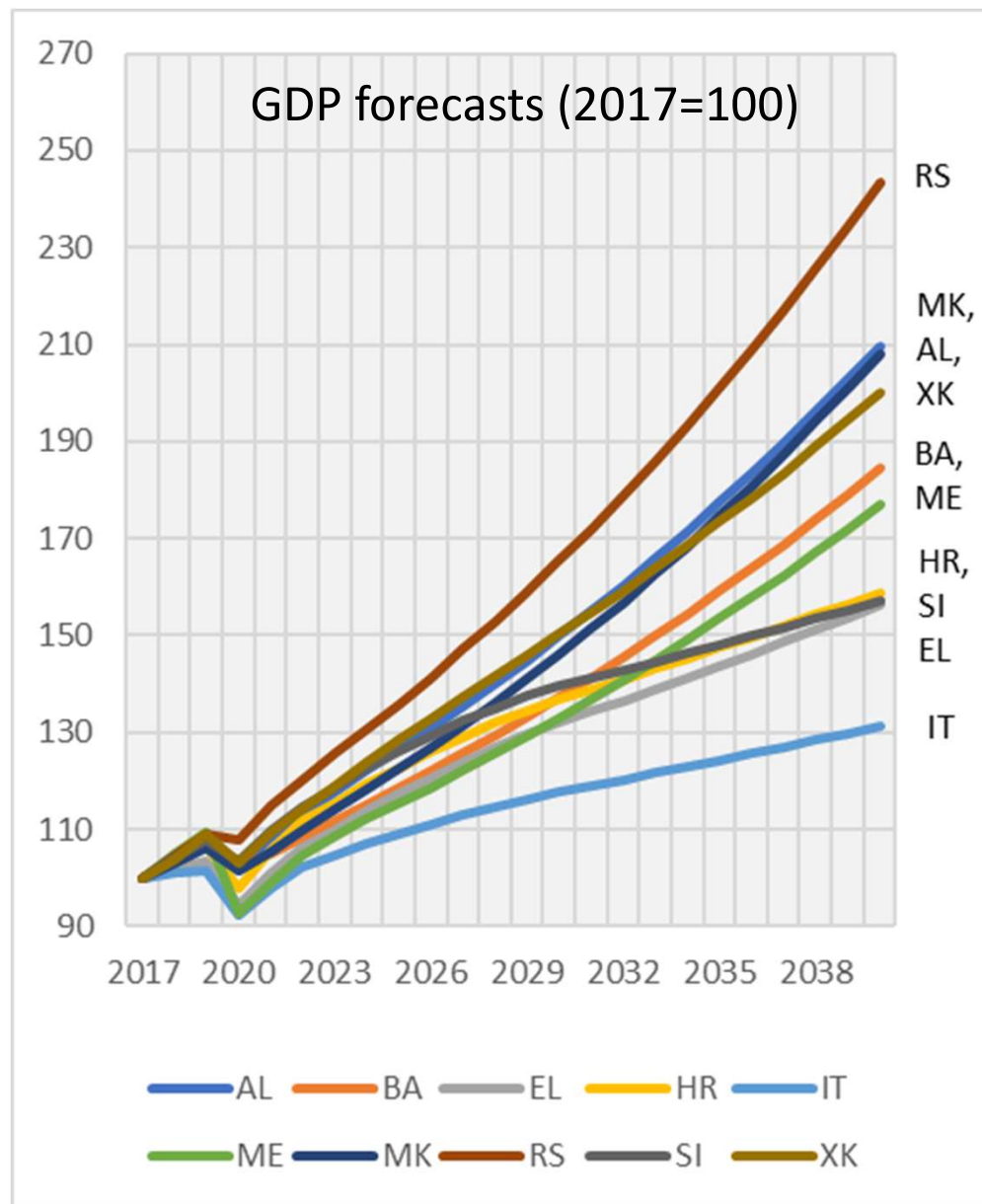
Network model

For any Origin-Destination (OD) estimation of the level of Service by mode (e.g. travel times, costs,…)

Assignment model

Allocation of demand flows to the most attractive paths on the rail and road network

SOCIOECONOMIC ASSUMPTIONS

GDP forecasts (2017=100)
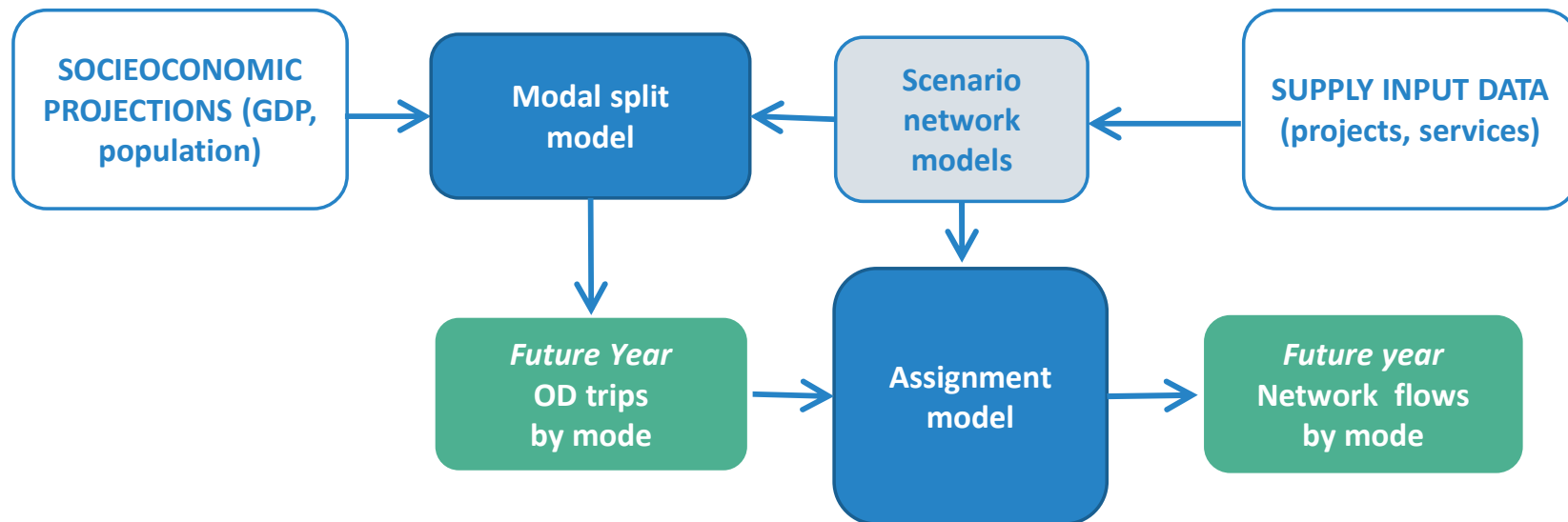
> The socioeconomic model assumptions for the future scenarios include
>   - GDP
>   - Population
>   - Car Ownership

> The projections are based on the following sources
>   - EUROSTAT
>   - European Commission (Ageing Report, Economic Forecasts)
>   - International Monetary Fund (World Economic Outlook)

SOCIOECONOMIC ASSUMPTIONS: FOCUS ON CAR OWNERSHIP

➢ Car ownership is a key input to forecast future modal share

➢ A specific car-ownership model was calibrated base on country-level time series data at the EU level on the number of registered vehicles and GDP per capita

➢ The model was then used to develop forecasts for future time horizons taking into account GDP per capita projections

➢ The results show a consistent convergence of national car ownership compared to current wide-ranging levels

Car ownership forecasts
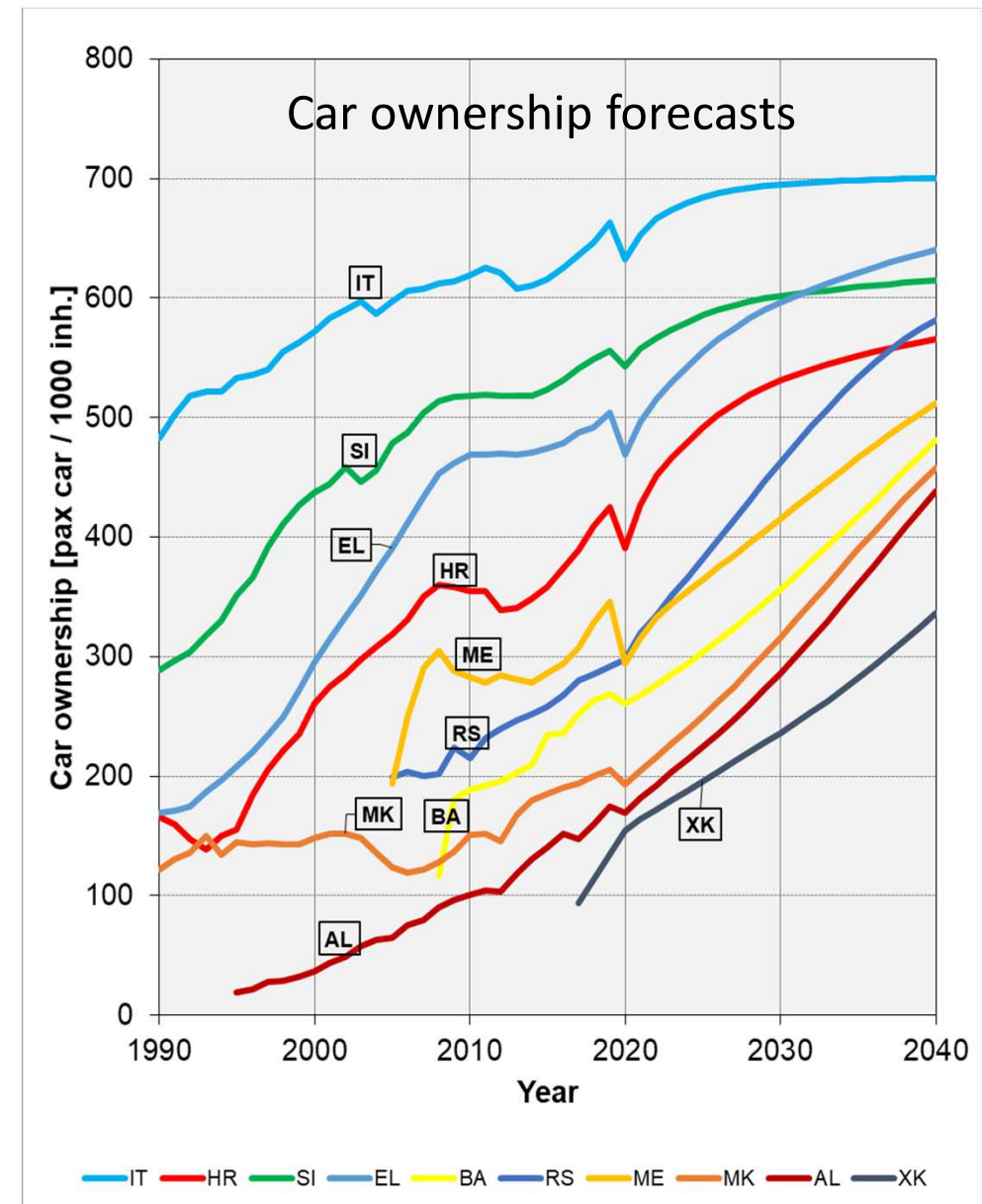
MODEL RESULTS: INDICATORS

➢ The EMTM outputs are used to estimate KPI to evaluate the Transport Performance foe each modelled scenario

➢ The indicators are grouped into three macro-categories:
  ▪ Connectivity indicators (supply-side)
  ▪ Multimodality indicators (demand-side)
  ▪ Network use intensity (supply/demand interaction)

➢ The proposed indicators for the model base year (2017) and the two baseline scenarios (2030 and 2040) are then calculated, compared and analysed
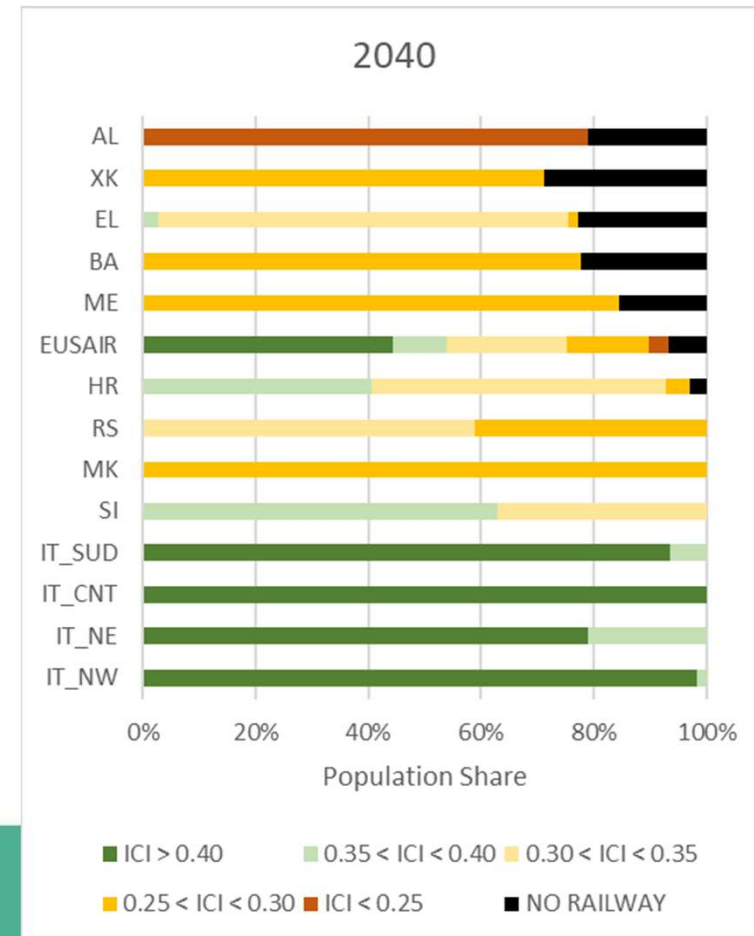
ROAD AND RAIL CONNECTIVITY INDICATORS: DEFINITION

➢ The **road and rail Infrastructure Connectivity Index (ICI)** is calculated as the average of the ratios between the simulated inter-zonal travel time on the existing networks and a reference travel time calculated assuming reference speeds (120 km/h for road and 150 km/h for rail) on the entire network

➢ The index is evaluated for each zone with reference to all the other zones of the EUSAIR region and the values, between 0 and 1, represent the infrastructural gap compared to the reference performance

➢ The results are presented
  ▪ In tabular/graphic formats, showing the population by Interconnectivity Quality Index band and by country
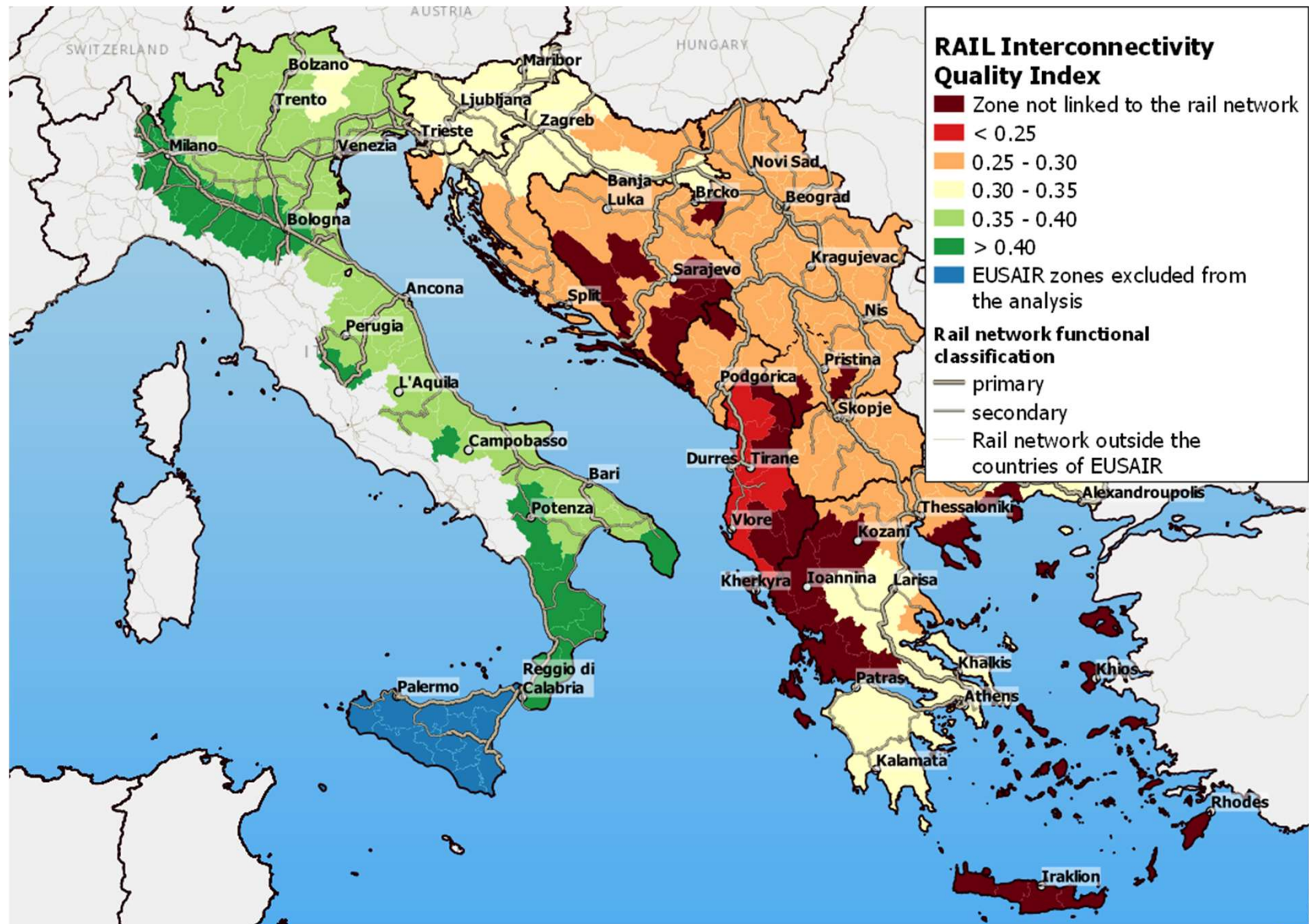 ▪ In graphical formats (by zone)

RAIL CONNECTIVITY INDICATORS: RESULTS

➢ In the EUSAIR region, the rail connectivity indicators show an overall positive trend: the population living in zones with poor rail connections (ICI lower than 0.30) declines from 35.6% to 24.6%

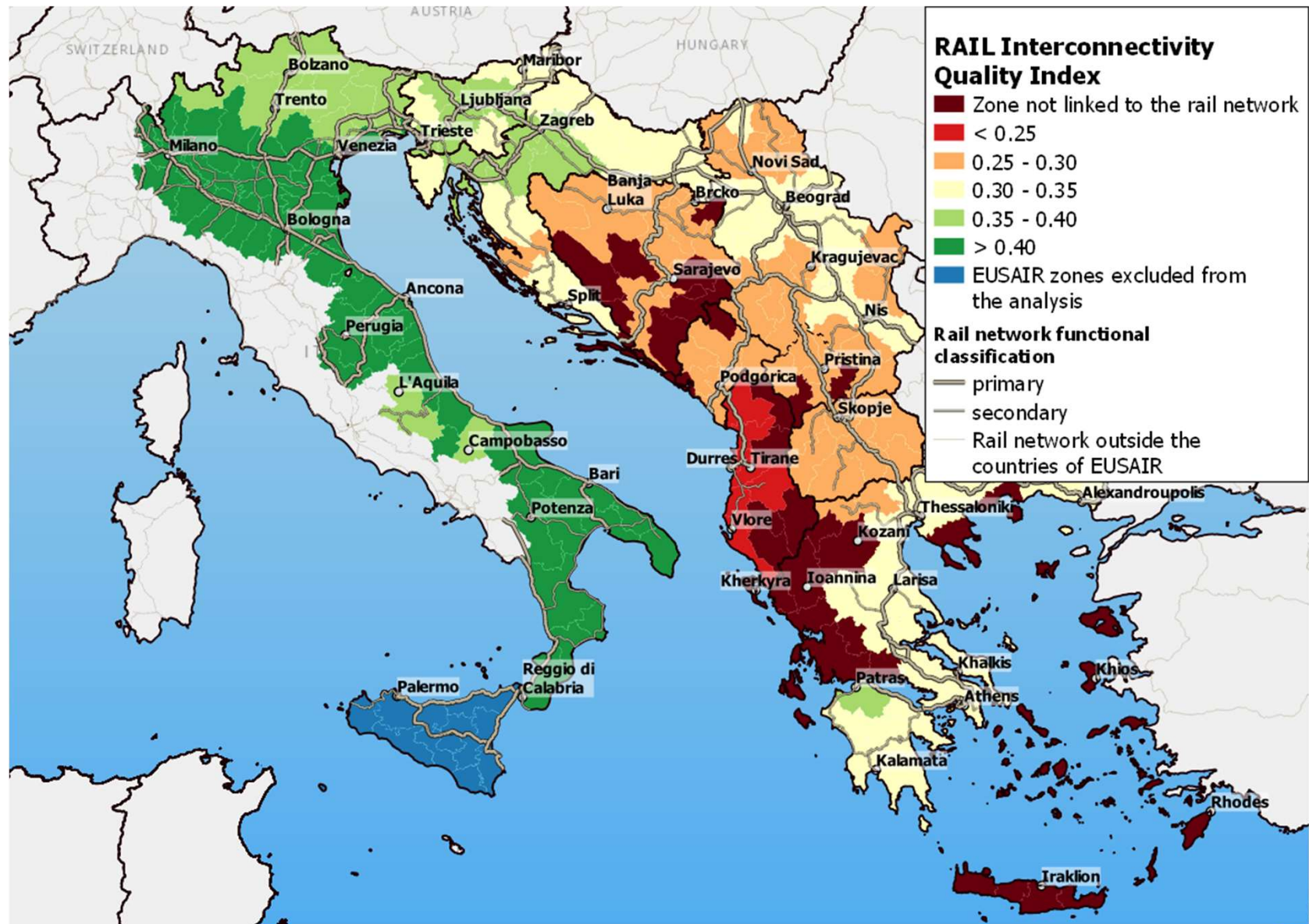➢ The major improvements are in Croatia, Greece, Slovenia and Italy
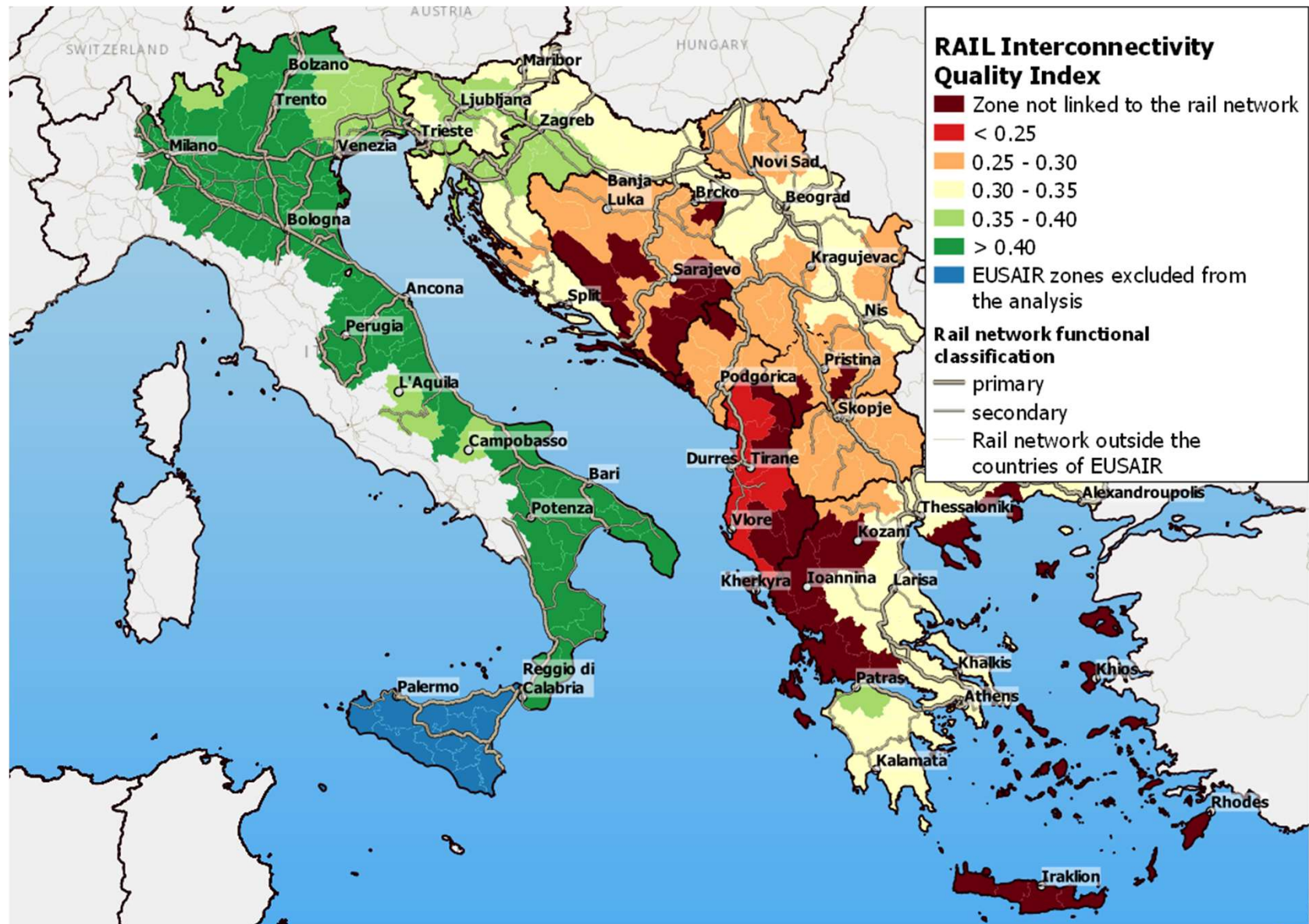
RAIL CONNECTIVITY INDICATORS: MAP BY ZONE (2017)

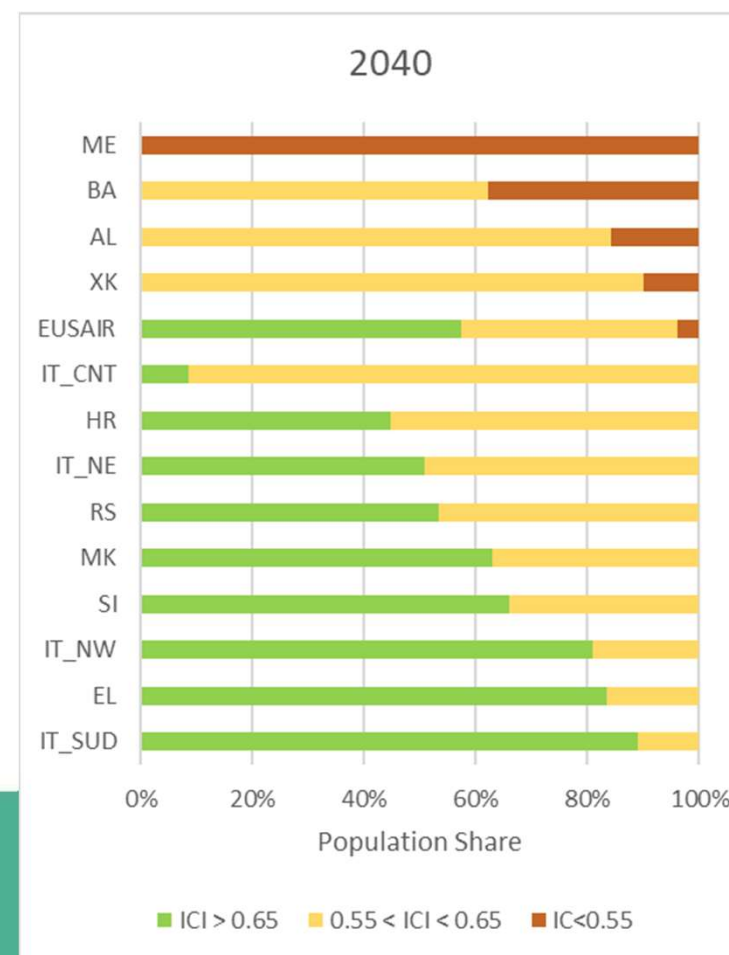# RAIL CONNECTIVITY INDICATORS: MAP BY ZONE (2030)
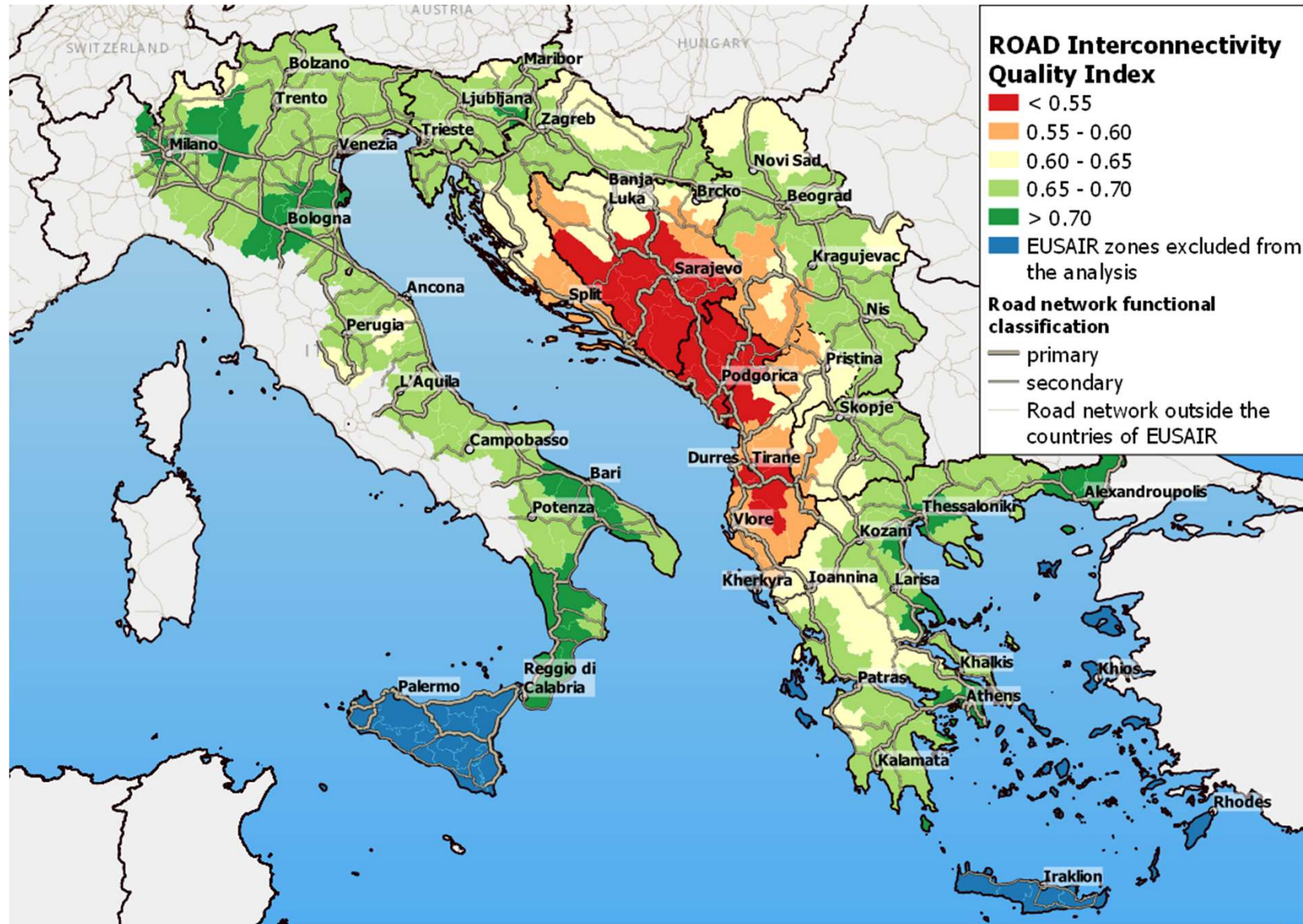
RAIL CONNECTIVITY INDICATORS: MAP BY ZONE (2040)

ROAD CONNECTIVITY INDICATORS: RESULTS

➢ For the EUSAIR region, the road connectivity indicators show that the situation is currently sufficient in most zones and it only marginally improves: the population living in zones with poor road connection (ICI lower than 0.55) declines from 5.7% to 3.8%

➢ However, major country in 2040 still suffer from bad or insufficient connection (ME, AL, BA). Other countries (HR, IT, RS) face increasing congestion
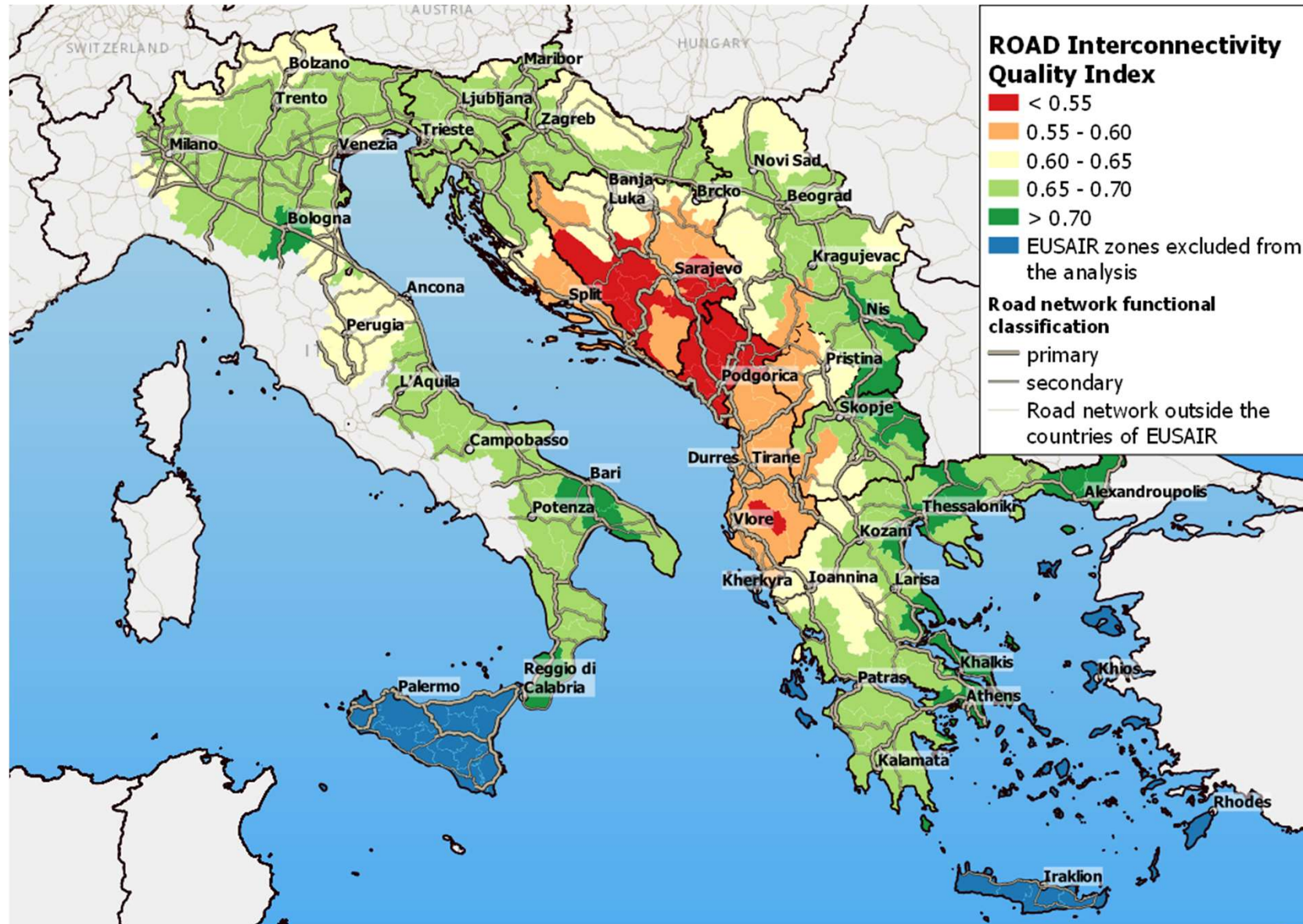
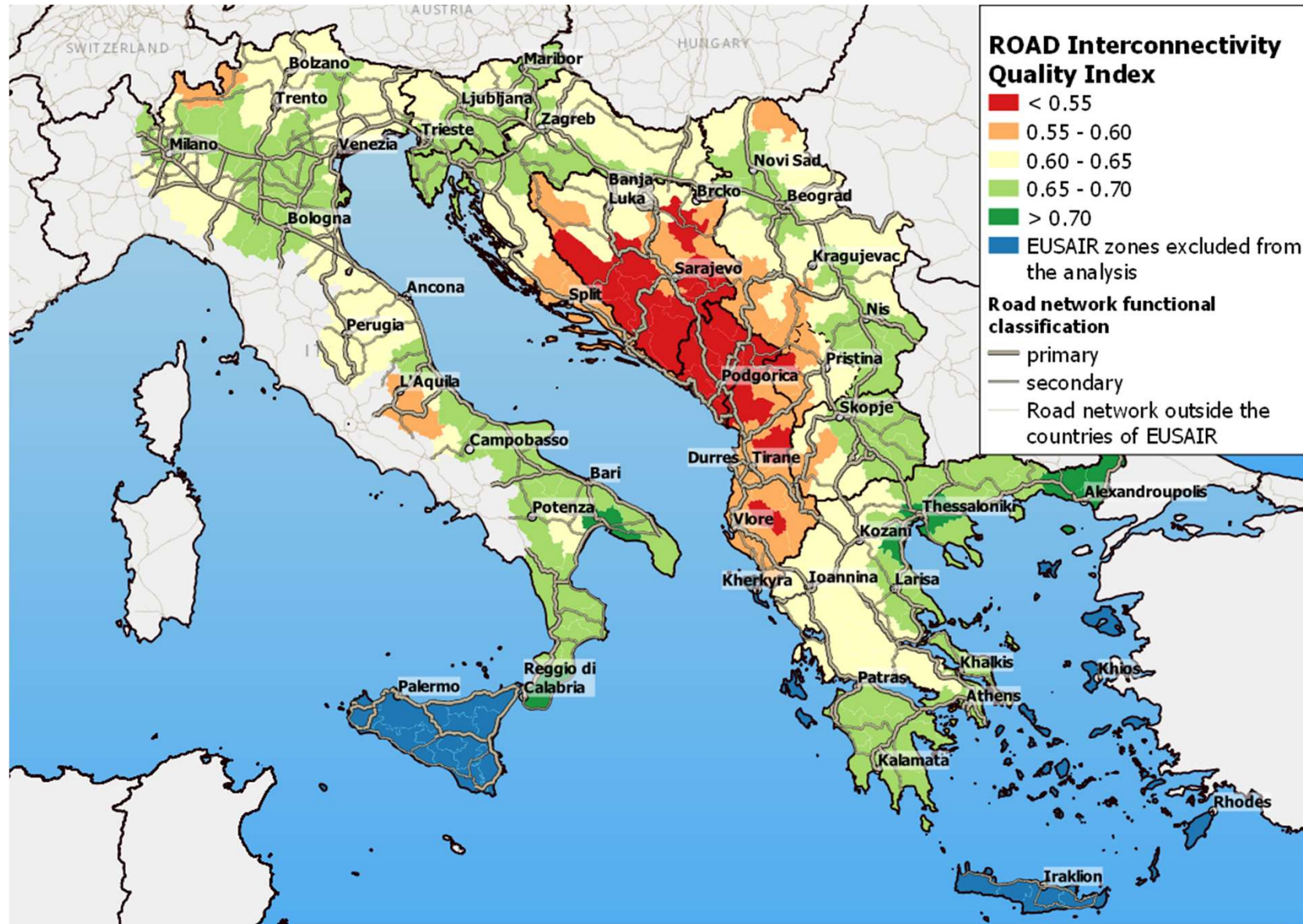# ROAD CONNECTIVITY INDICATORS: MAP BY ZONE (2017)

ROAD CONNECTIVITY INDICATORS: MAP BY ZONE (2030)

ROAD CONNECTIVITY INDICATORS: MAP BY ZONE (2040)
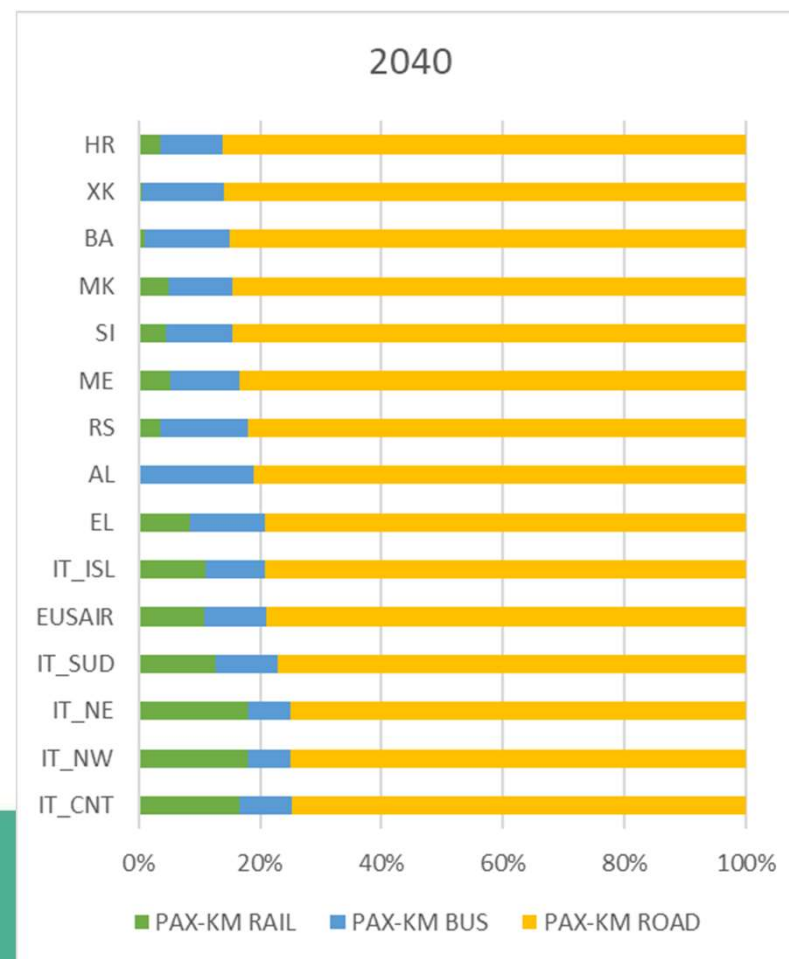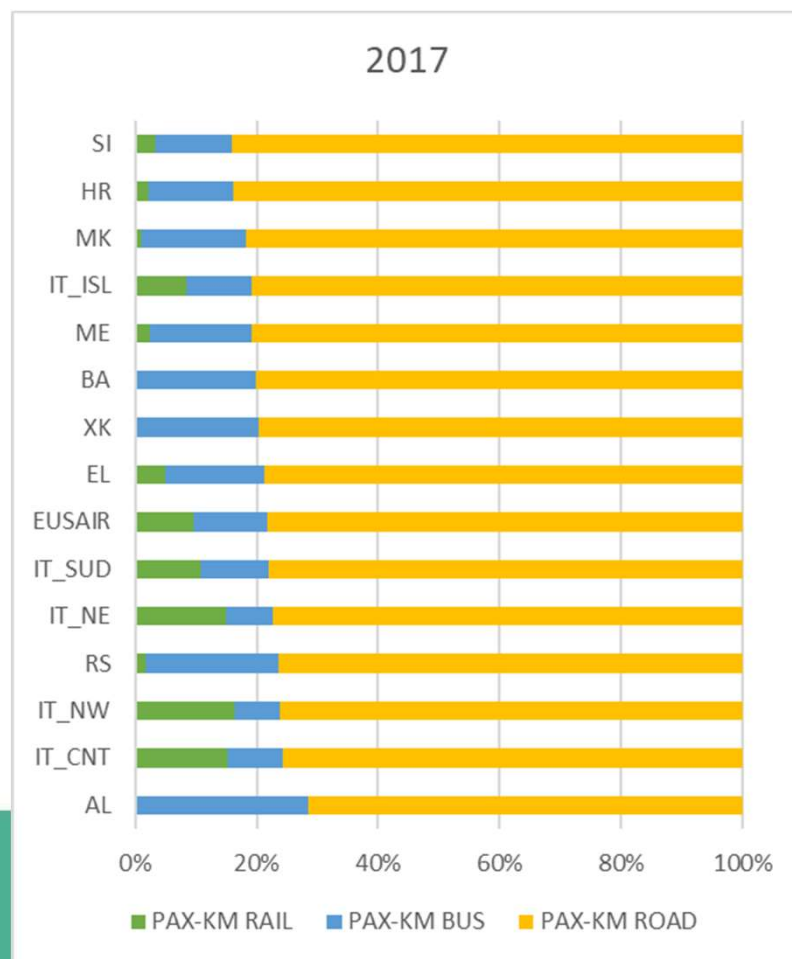
MODAL SHARE INDICATORS: DEFINITION

➢ The **passenger and freight modal shares** by country are calculated based on the transport activity (passenger-km and tonnes-km) on the network ("territorial" approach by EUROSTAT and DG MOVE Pocketbook)

➢ Passenger modal shares by zone is instead calculated based on the sum of the pax and freight transport volumes generated and attracted in each zone

➢ The results are presented
  ▪ In tabular/graphic formats, showing the share of transport activity by mode and by country
 ▪ In graphical formats (by zone)

MODAL SHARE INDICATORS: RESULTS FOR PASSENGER TRANSPORT

➢ In the EUSAIR region, the modal share of public transport (bus and rail) is stable (21.8% in 2017 and 21.0% in 2040), but with a very mixed trend, due to the generalised decline of bus (mainly in Eastern EUSAIR countries) and different growth in rail by country

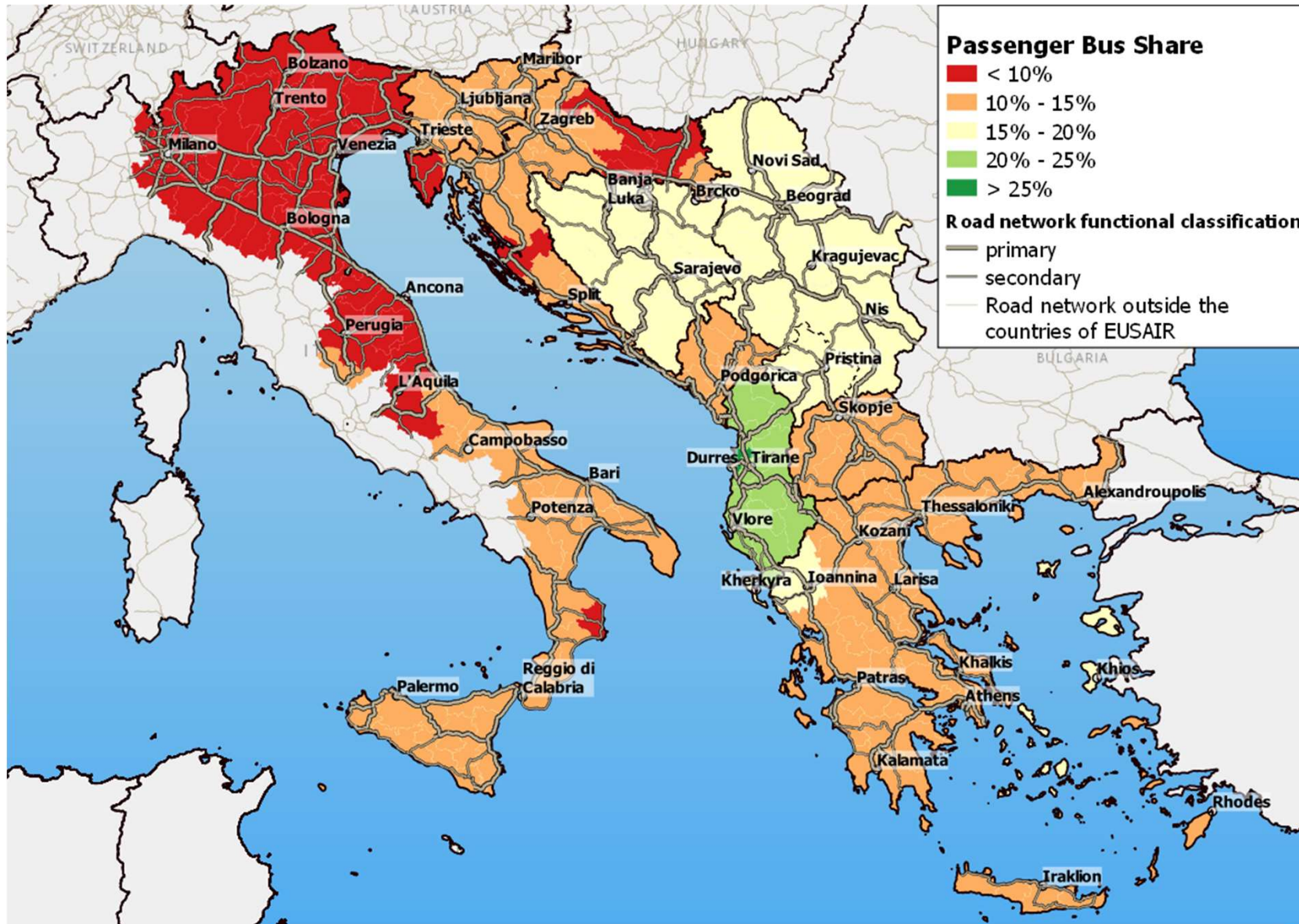➢ The major improvements for rail transport are in Italy, Greece and Macedonia

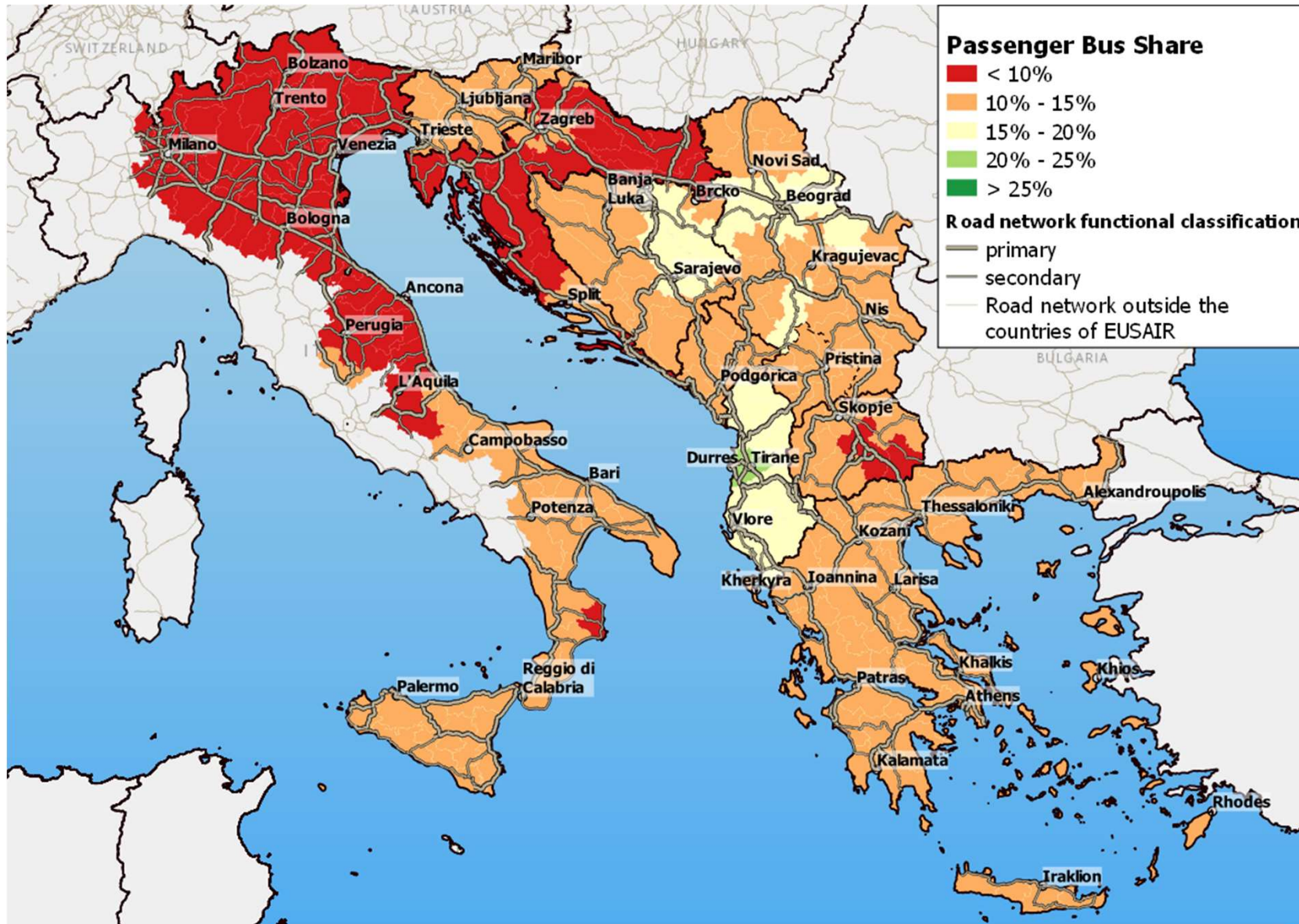# BUS MODAL SHARE: MAP BY ZONE (2017)
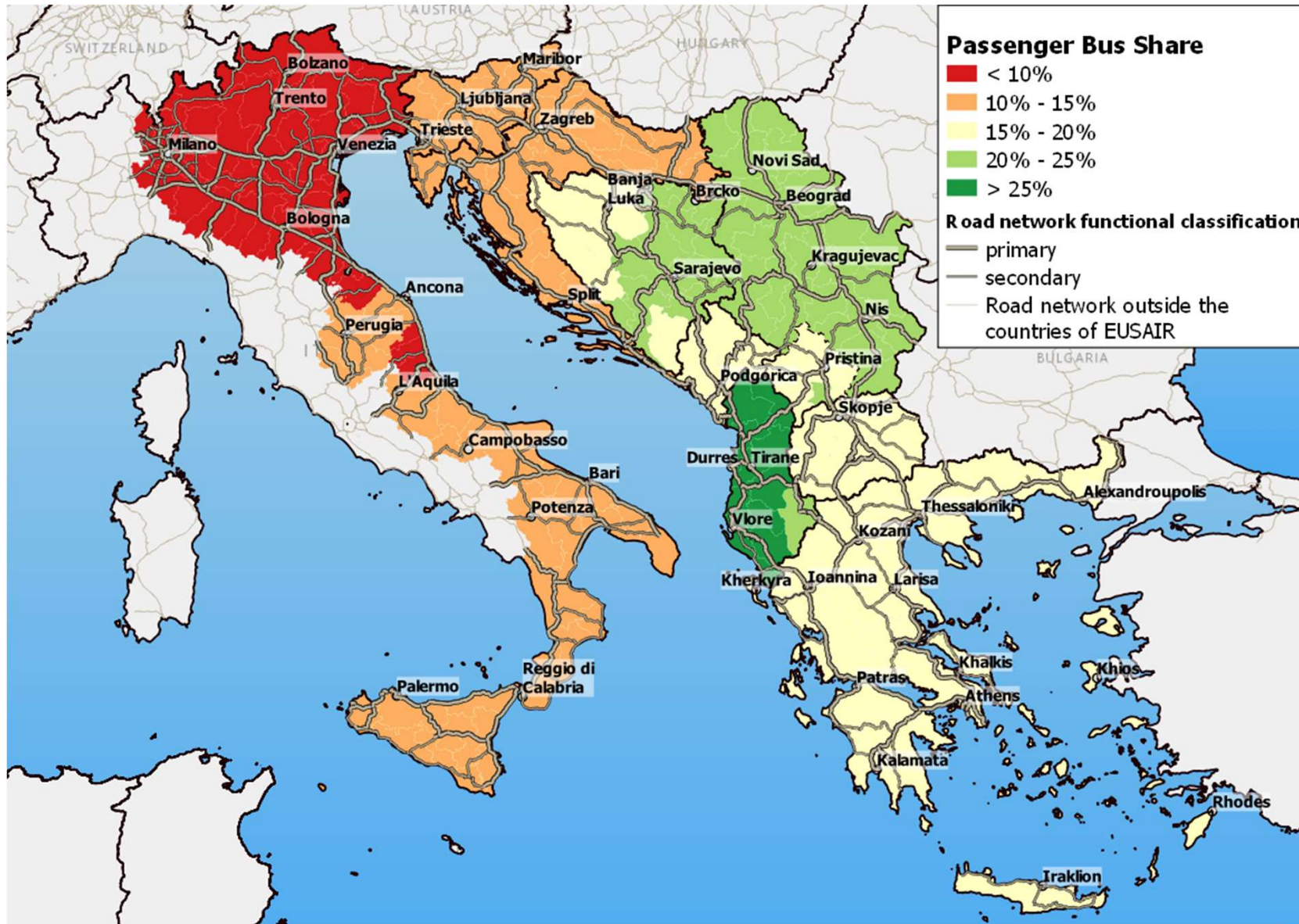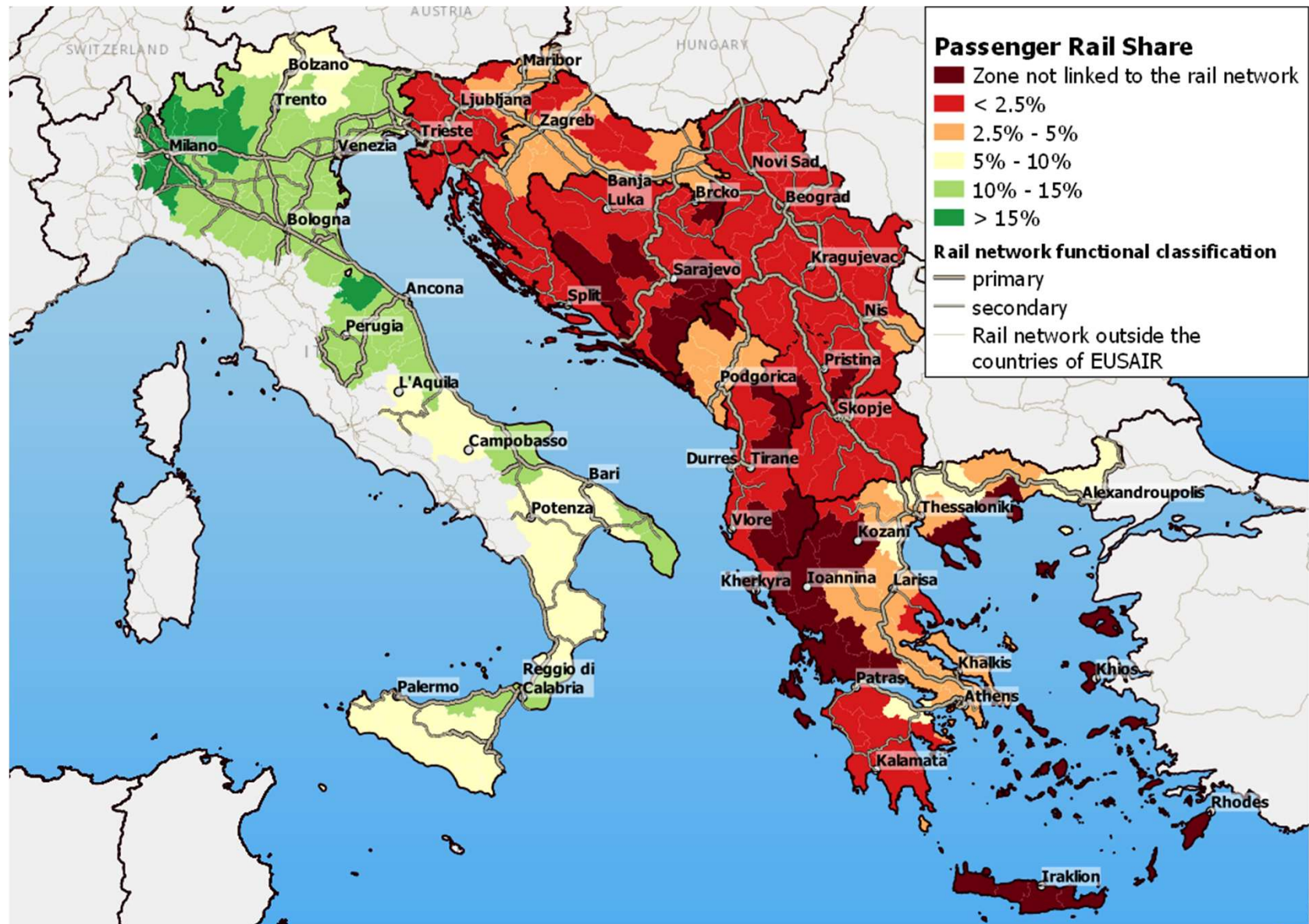
BUS MODAL SHARE: MAP BY ZONE (2030)
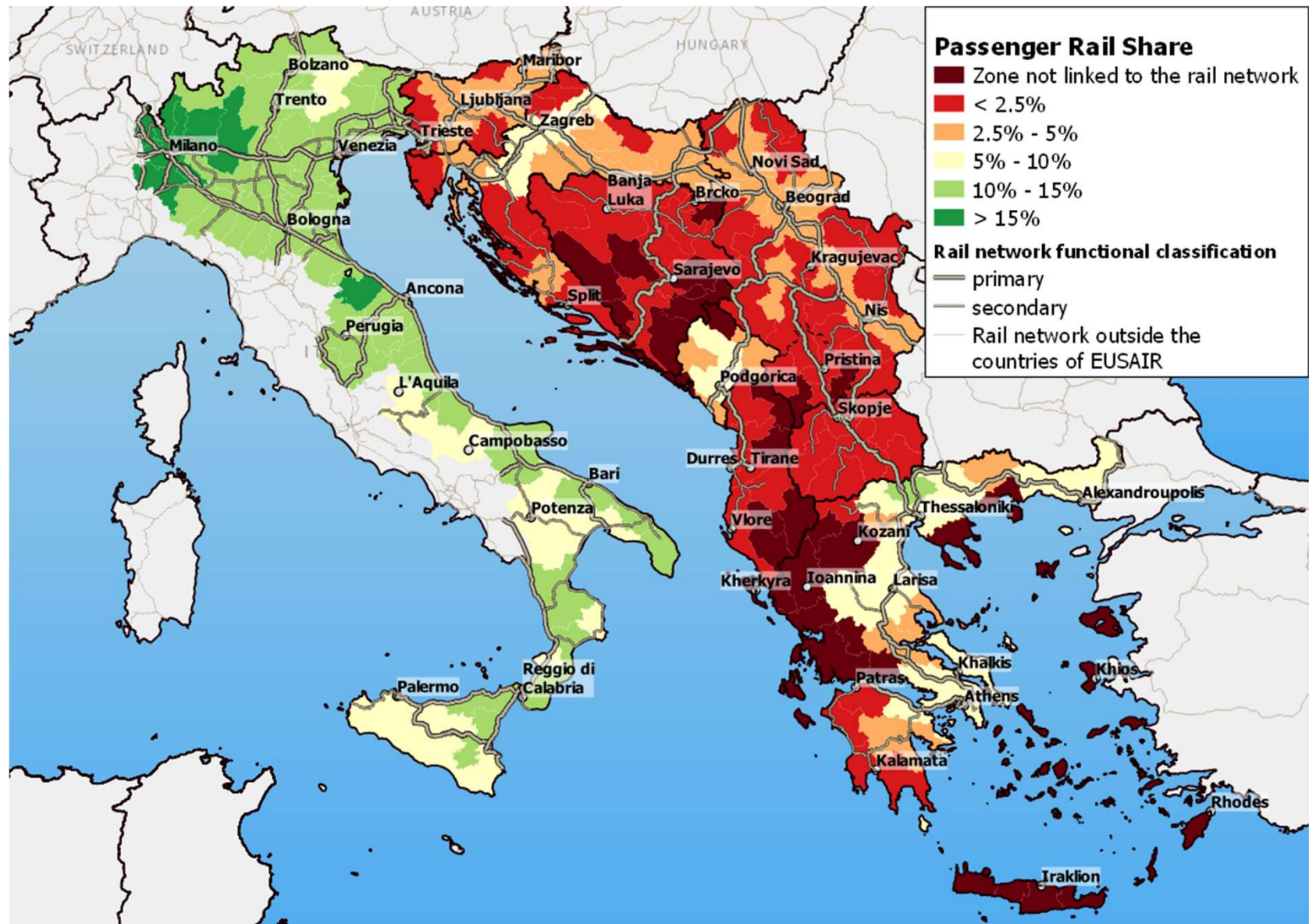
BUS MODAL SHARE: MAP BY ZONE (2040)

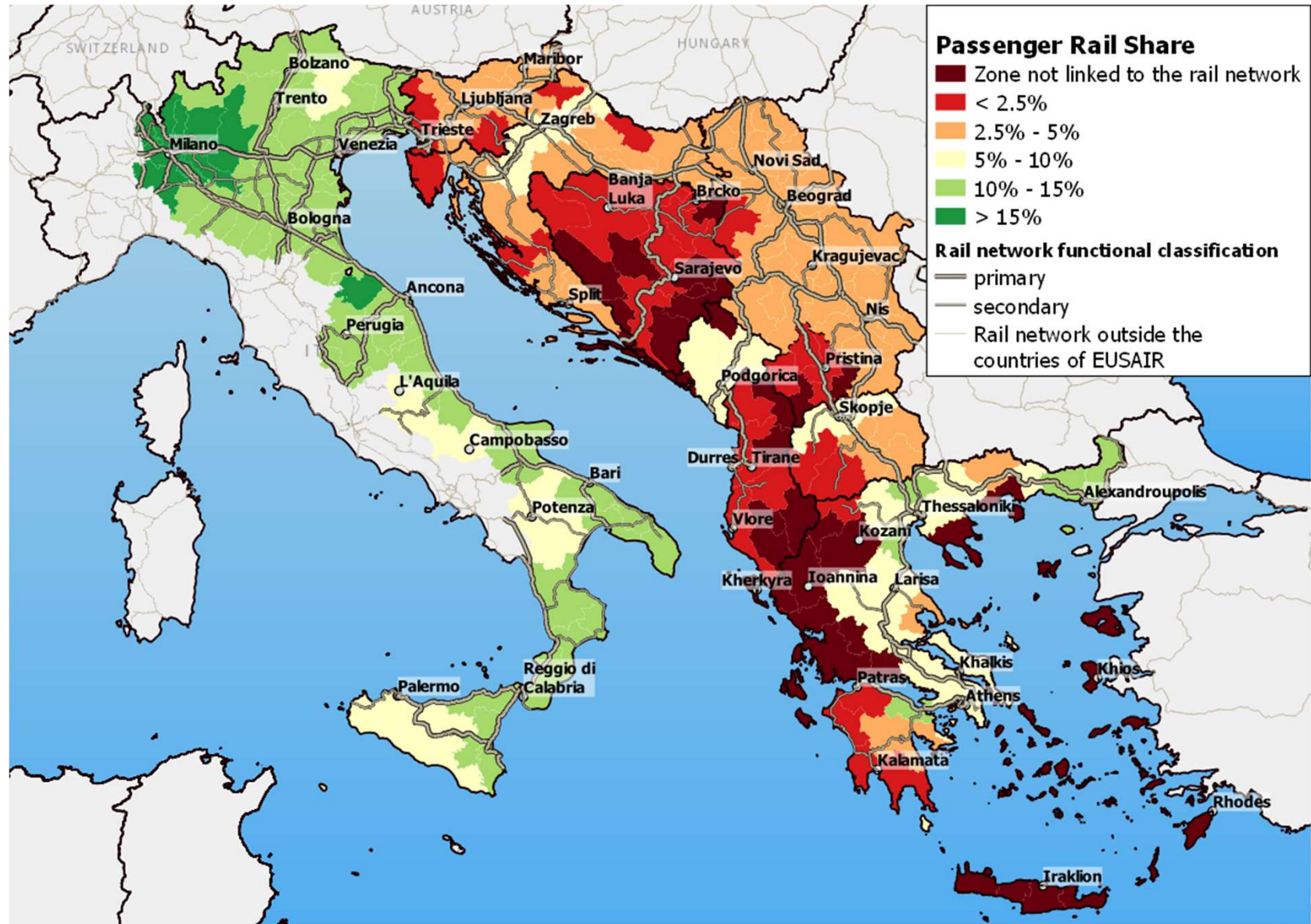# RAIL PAX MODAL SHARE: MAP BY ZONE (2017)
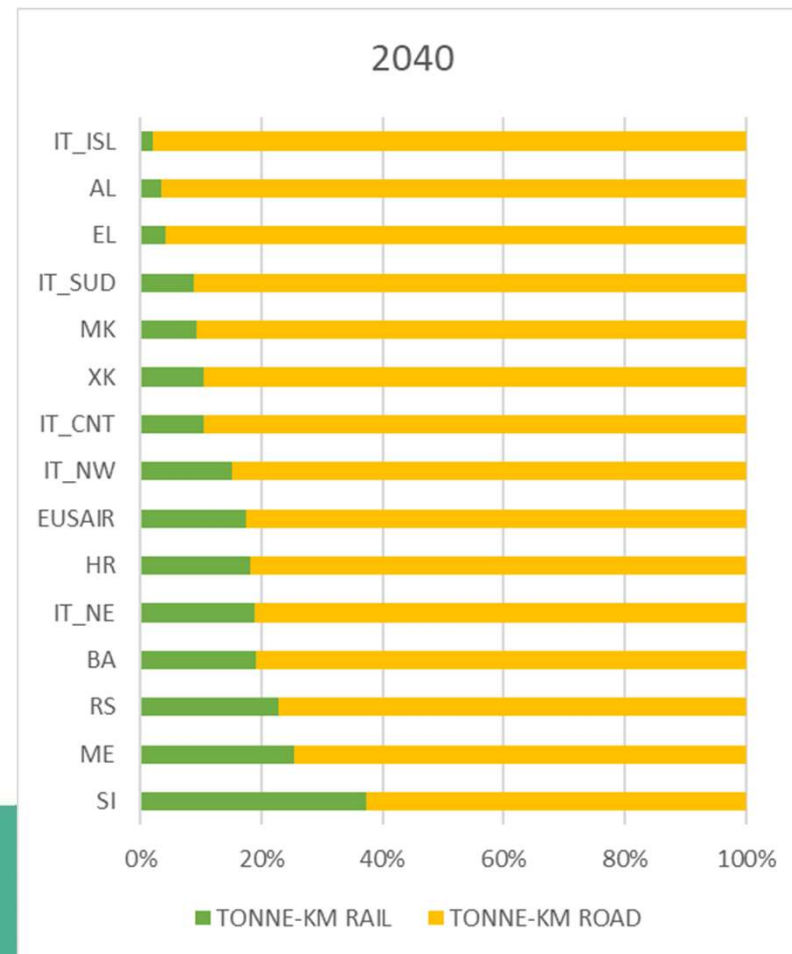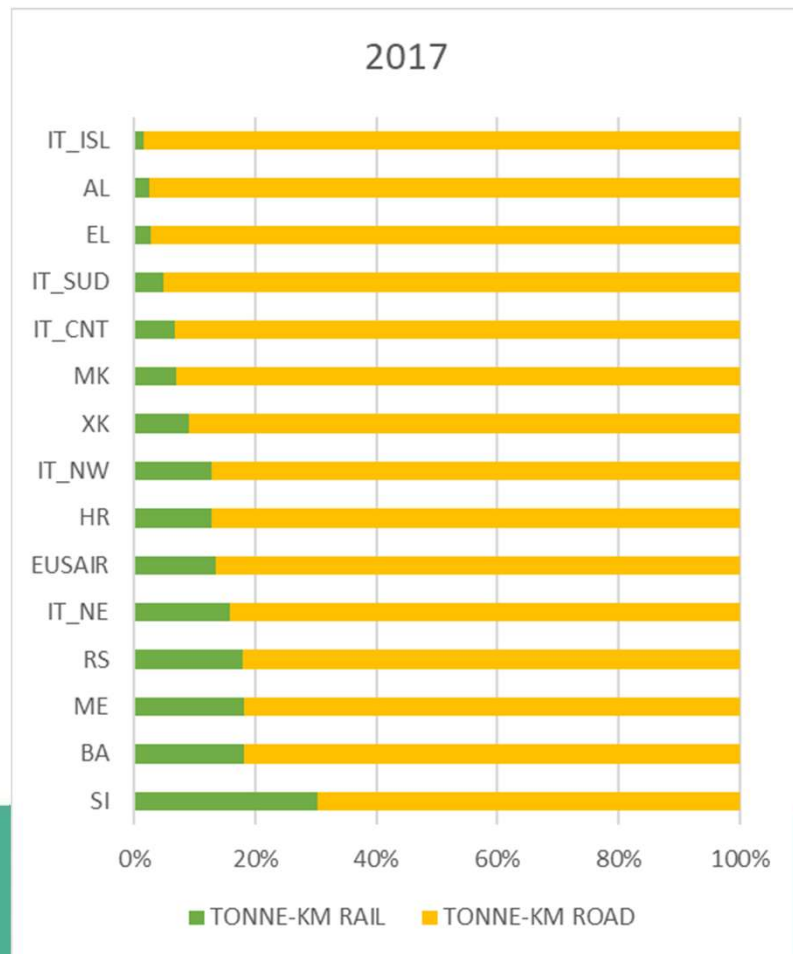
RAIL PAX MODAL SHARE: MAP BY ZONE (2030)

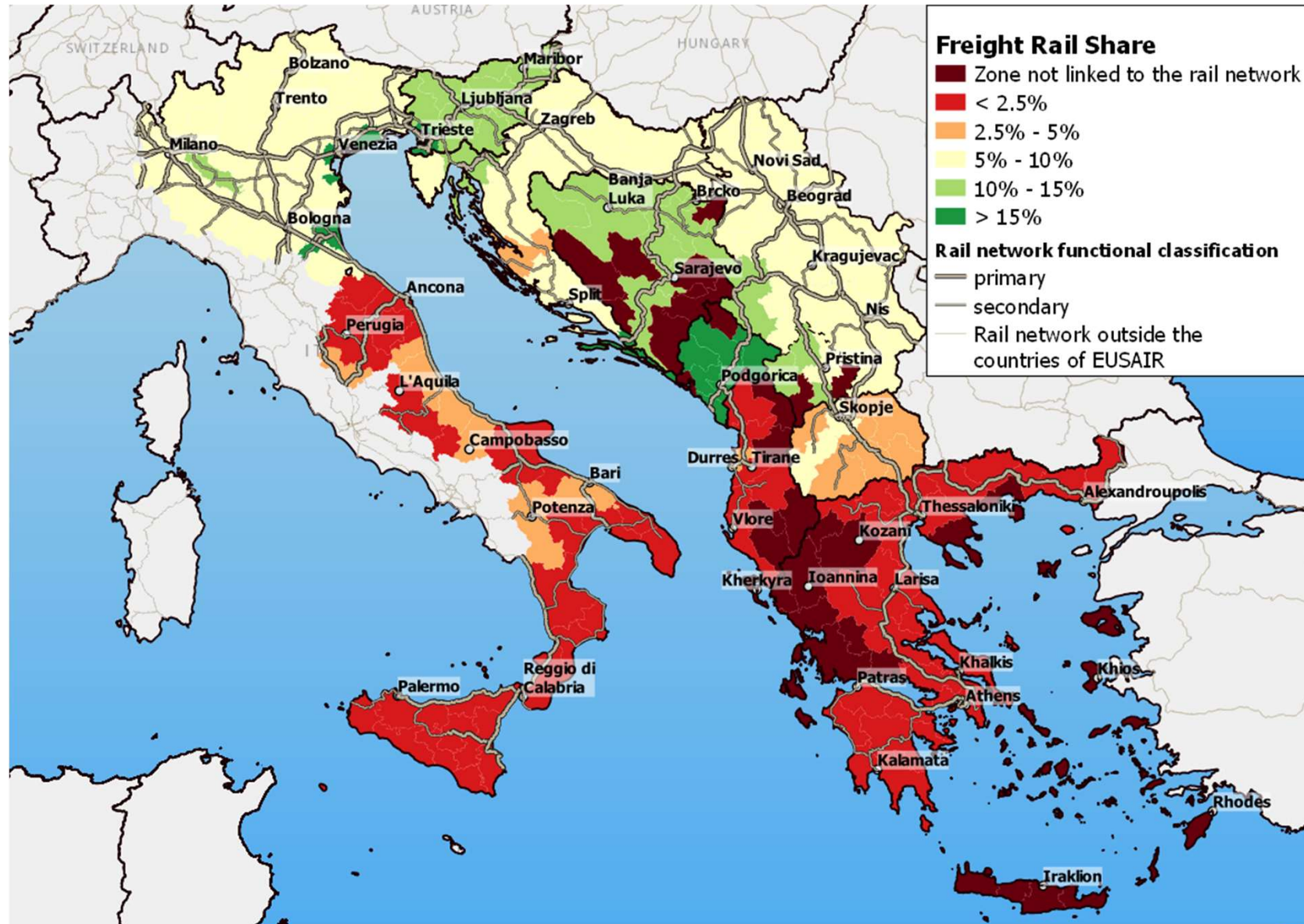# RAIL PAX MODAL SHARE: MAP BY ZONE (2040)

MODAL SHARE INDICATORS: RESULTS FOR FREIGHT TRANSPORT

➢ In the EUSAIR region, the modal shar of rail freight transport rises from 13.6% in 2017 to 17.4% in 2040

➢ The major improvements for rail transport are in Montenegro, Slovenia , Croatia and Serbia

RAIL FREIGHT MODAL SHARE: MAP BY ZONE (2017)

RAIL FREIGHT MODAL SHARE: MAP BY ZONE (2030)

RAIL FREIGHT MODAL SHARE: MAP BY ZONE (2040)

Freight Rail Share
- Zone not linked to the rail network
- < 2.5%
- 2.5% - 5%
- 5% - 10%
- 10% - 15%
- > 15%

Rail network functional classification
- primary
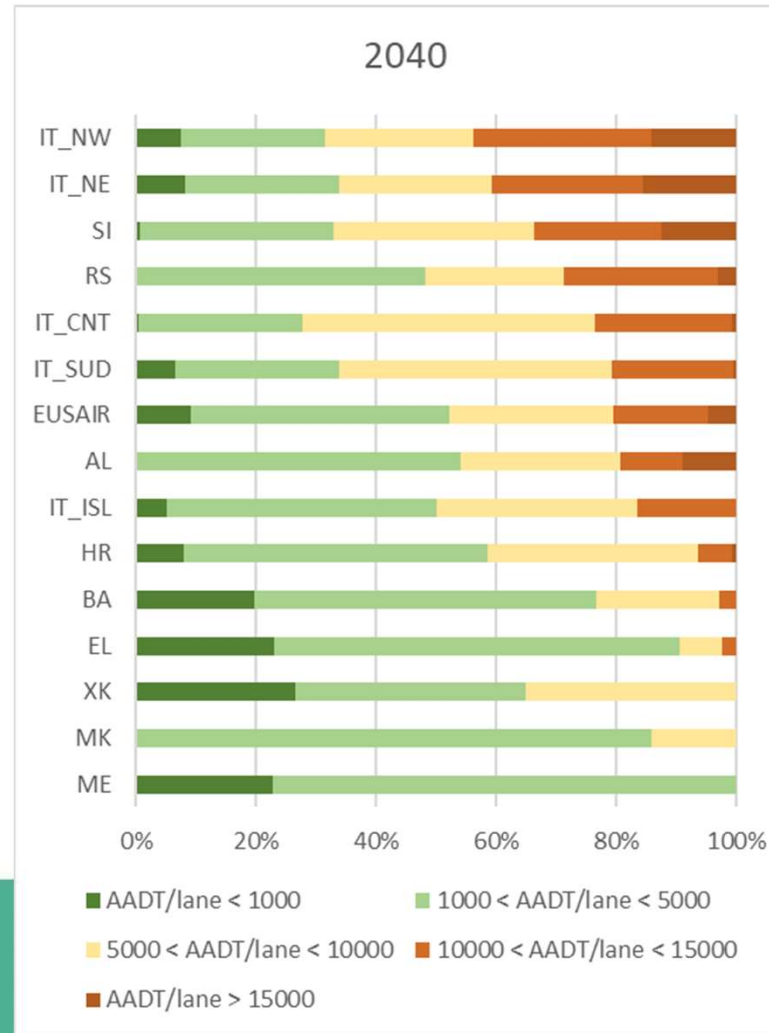- secondary
- Rail network outside the countries of EUSAIR
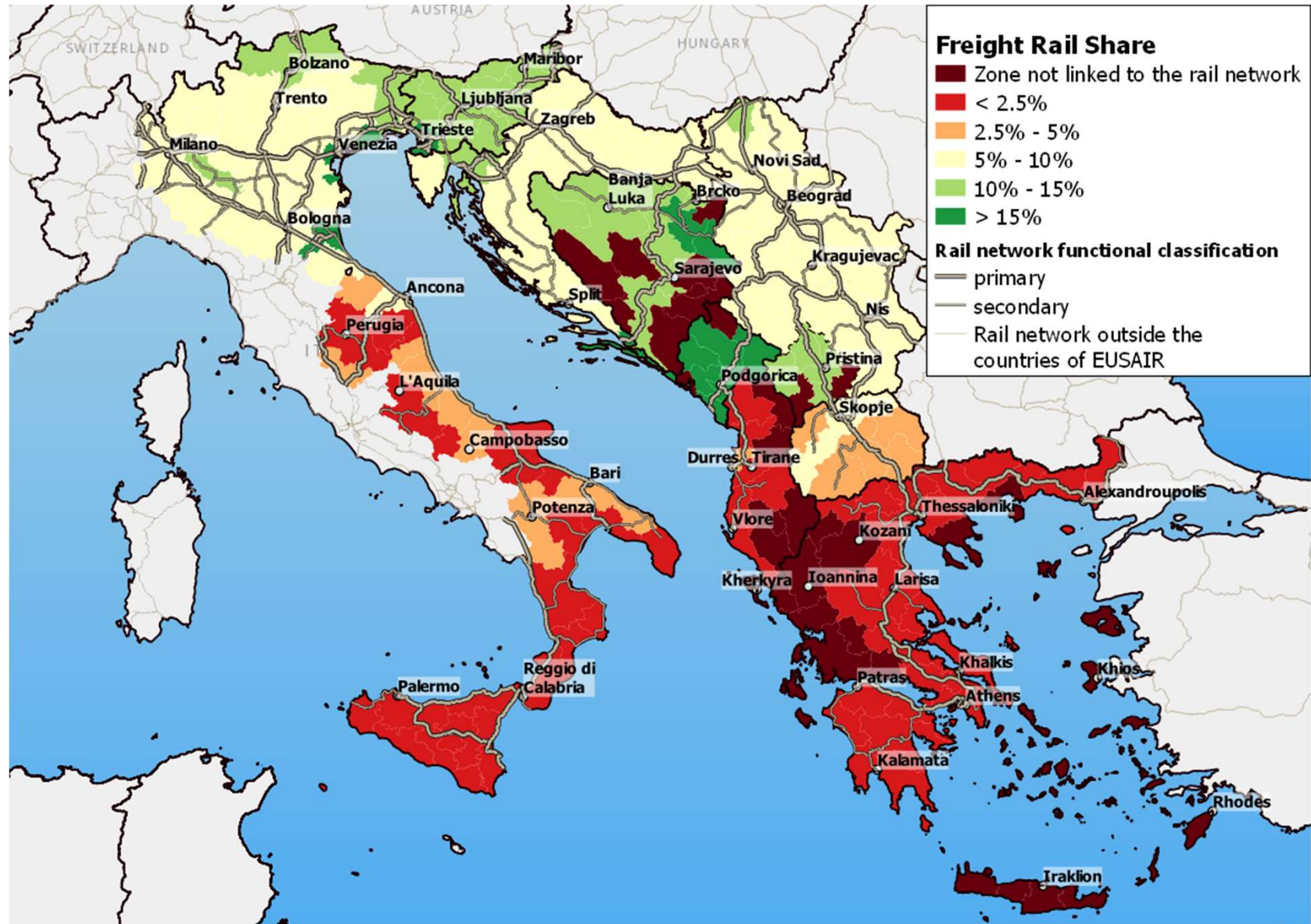
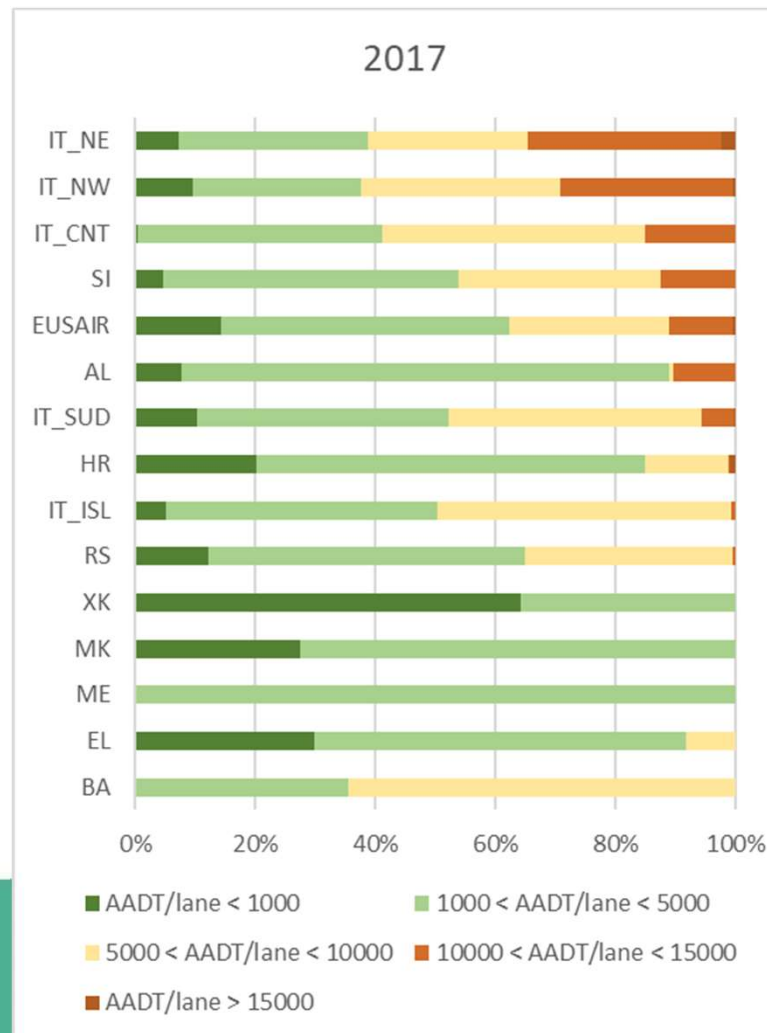# ROAD NETWORK USE INTENSITY: DEFINTION

➢ The **road network use intensity** indicator shows the network length by band of annual average daily traffic per lane, expressed in vehicles/day per lane [AADT/lane], and by country

➢ The results are presented
- In tabular/graphic formats, showing the share of network length by daily traffic volume band and by country
- In graphical formats (on the model road network)

ROAD NETWORK USE INTENSITY: RESULTS (PRIMARY NETWORK)

➢ In the EUSAIR region, traffic intensity on the primary network increases: the length of the network with AADT above 10.000 rises from 11.1% to 20.4%

➢ Traffic congestion in 2040 is mainly limited to Italy, Slovenia, Serbia and in the main connections or bypass links in the metropolitan areas

ROAD NETWORK USE INTENSITY: RESULTS (SECONDARY NETWORK)

➢ In the EUSAIR region, traffic intensity on the secondary network increases: the length of the network with AADT above 5.000 rises from 8.9% to 20.9%
➢ Traffic congestion in 2040 is occurs not only in countries with high volumes, but also in some areas lacking motorways
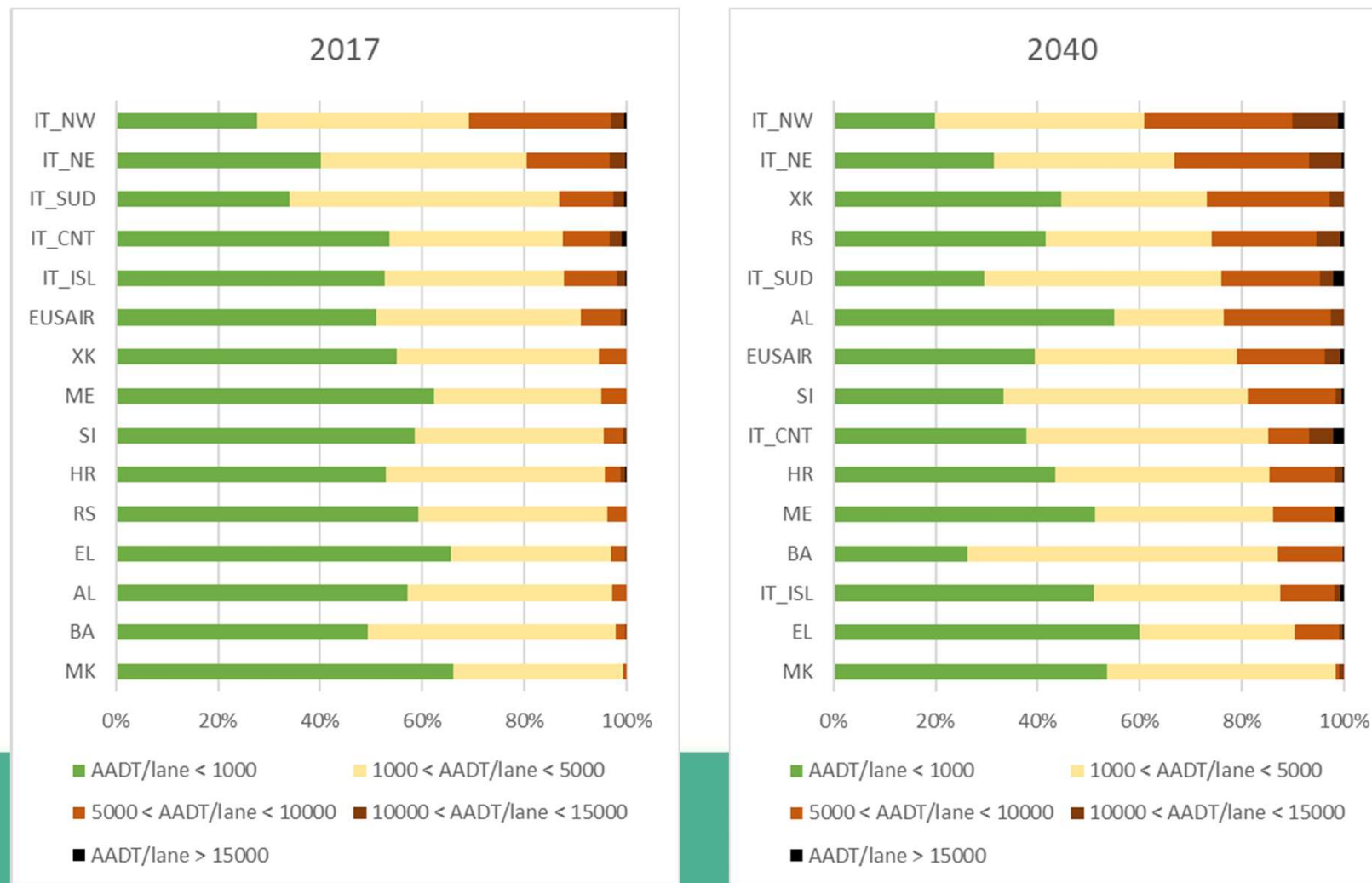
ROAD NETWORK USE INTENSITY: MAP BY LINK (2017)

ROAD NETWORK USE INTENSITY: MAP BY LINK (2030)

ROAD NETWORK USE INTENSITY: MAP BY LINK (2040)

KEY FINDINGS ABOUT TRANSPORT INFRASTRUCTURE

Road infrastructure

➤ The projects included in the baseline scenario do not allow to ensure a comparable interconnectivity to all EUSAIR regions – the main critical issue being the **interconnectivity of the coastal areas of the Balkans**

➤ Congestion is not an issue that is as critical as interconnection, except for key road links within and to metropolitan areas

Rail infrastructure

➤ The projects in the baseline scenario help improving the rail infrastructure on the main freight and passenger EUSAIR corridors (Adriatic Corridor in Italy, Alpine – Western Balkan Corridor)

➤ However, the **interconnectivity of more peripheral regions** – especially in the Balkans – is still insufficient, and this is shown in relatively low gains in rail passenger modal share

Presentation prepared by Tplan Consulting S.r.l.
and FIT Consulting S.r.l.

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