CORCAP Partner Meeting
Partner Meeting | 3 + 4 September 2020

CORCAP – GENERAL SYSTEM APPROACH FOR LOW-COST IMPROVEMENTS FOR RAIL FREIGHT (D.T2.3.7) – SUMMARY

GYSEV Zrt. / Dr. Gerhard Troche

ABOUT DELIVERABLE D.T2.3.7

CORCAP Thematic work package T2 - Multimodal freight transport pilot actions complementing OEM corridor development

O.T2.2.1 - Pilot actions for new and innovative intermodal services

D.T2.3.7: Development of a general system approach for low-cost improvements for rail freight (study)

→ The deliverable is one of four deliverables under the GYSEV Pilot Action (D.T2.3.7 – D.T2.3.10)

Structure of the study

I. Policy context

II. Market requirements and challenges in European rail freight

III. Small-scale low-cost infrastructure improvements in the context of rail freight development

IV. Measures for small-scale low-cost infrastructure improvement

V. Better inclusion of rail freight in regional and spatial planning

I. POLICY CONTEXT

1.1 The „European Green Deal”

- Set of policy initiatives proposed by the European Commission and supported by the European Parliament with the overarching goal to make Europe the first climate-neutral continent
- Objectives:
  - there are no net emissions of greenhouse gases by 2050
  - economic growth is decoupled from resource use
  - no person and no place are left behind
- Overall investment envisaged: 1 trillion EUR
- „Just Transition Mechanism” providing financial support and technical assistance to people, businesses and regions most affected by the move towards the green economy (at least 100 billion EUR in the most affected regions 2021-2027).

I. POLICY CONTEXT

1.1 The „European Green Deal" – (cont.)

- Transport accounts for a quarter of the EUs greenhouse gas emissions and these continue to grow. Consequently, a sustainable and smart mobility strategy – for both freight and passenger – is an essential element of the European Green Deal
- The Green Deal re-confirms earlier objectives, i.a. the objective to transport a higher share of freight by rail and water
- Rail to play a crucial role, due to combination of:
  - Already high level of independency from a specific primary source of energy (ability to use „green energy" thanks to high share of electrification)
  - High energy-efficiency due to low friction of the steel-wheel on steel-rail principle

I. POLICY CONTEXT

1.2 EU White Paper on Transport

- Laying down key objectives of EU transport policy
- Latest White Paper published 2011, usually update each 10 years
- Overarching objective to reduce Greenhouse Gas Emissions (GHG) by 60 % until 2050
- Shifting 30 % of long-distance road freight (>300 km) to more energy-efficient modes of transport by 2030 (50 % by 2050).
- Integrating transport modes; proper connection of all Core Network seaports to the European rail system
- Creating a truly Single European Rail Area (SERA):
  - Market opening and better governance of the railway system
  - Technical harmonization across borders and simplified procedures

I. POLICY CONTEXT

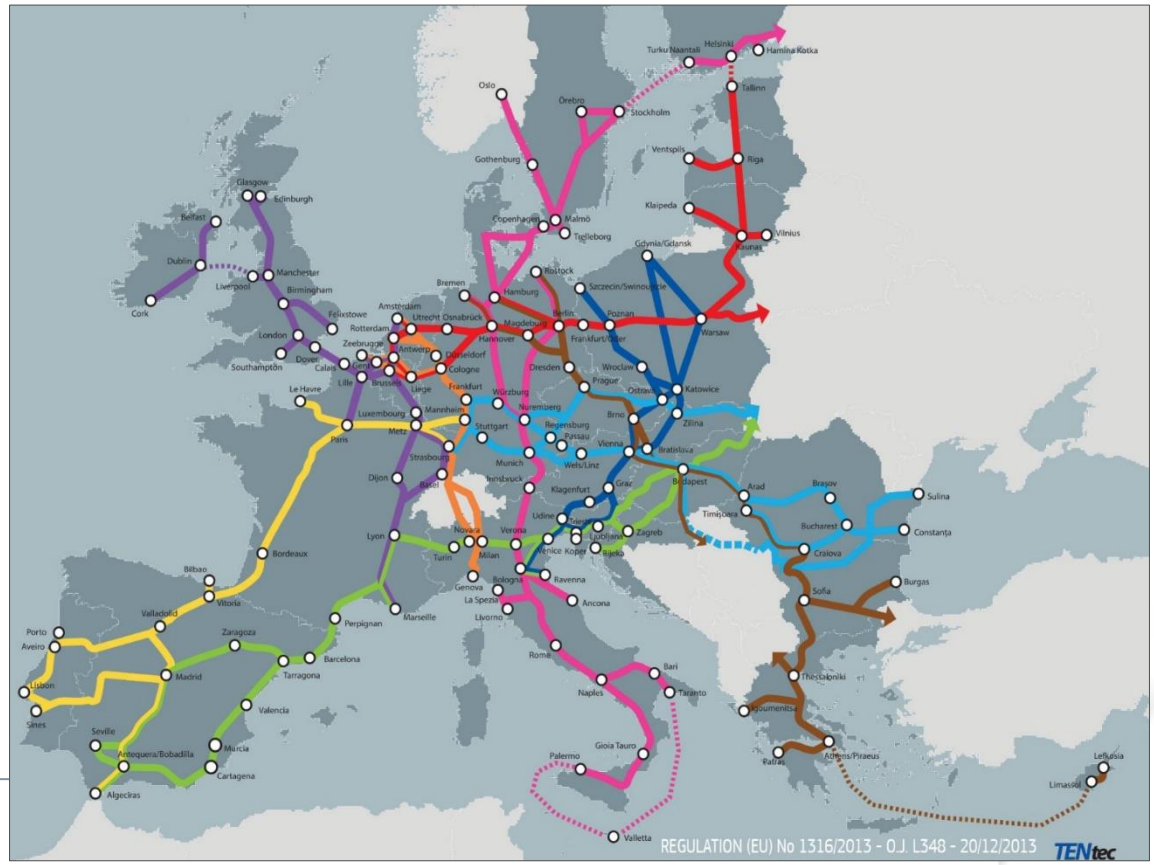
1.3 Trans-European Network for Transport (TEN-T) and Core Network Corridors

- Importance of rail freight in the TEN-T policy reflected by the fact that a dedicated Core Network for freight, covering the main railway lines for freight transport
- Minimum infrastructure standards to be implemented by 2030:
  - 740 m train length
  - 22.5 t axle-load
  - 100 km/h line speed
  - ERTMS
  - Electrification
- Connecting Europe Facility (CEF) and the structural funds as financing instruments

I. POLICY CONTEXT

1.3 Trans-European Network for Transport (TEN-T) and Core Network Corridors – (cont.)

- Core Network Corridors (CNCs) defined as an instrument to foster implementation of the Core Network
- CNCs comprise a subset of the Core Network



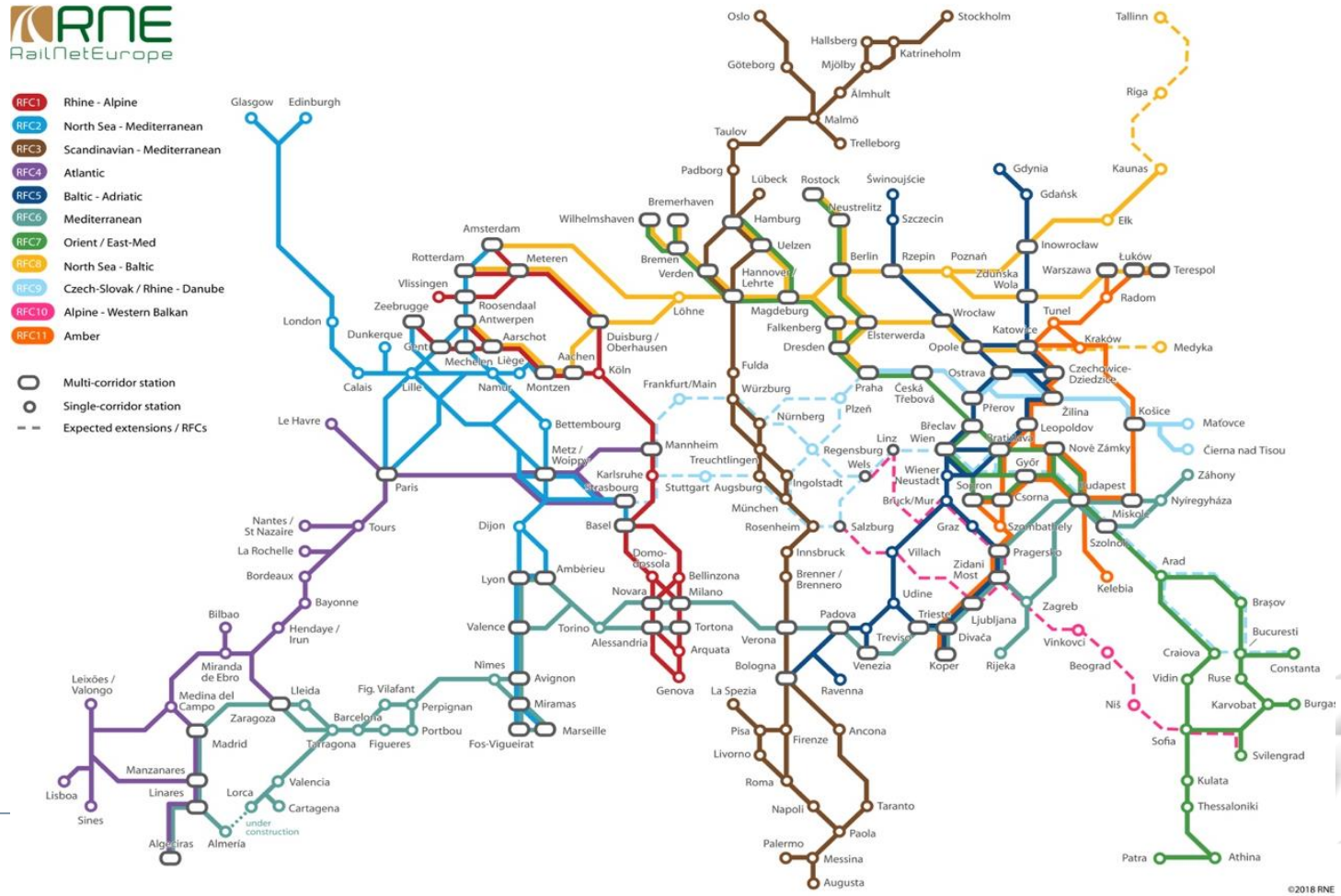
I. POLICY CONTEXT

1.4 EU Rail Freight Corridors (RFCs)

- Rail freight backbone of the TEN-T network
- Objectives:
  - Facilitating cross-border rail freight
  - Strengthening international cooperation of Infrastructure Managers and Member States
  - Providing capacity of good quality for international rail freight
  - Improving customer orientation (i.a. through Advisory Groups for Railway Undertakings and Terminals)
- Permanent dedicated governance structures with legally defined competences and obligations
- 2020: Eleven RFCs, of which two voluntarily set up by Member States concerned

I. POLICY CONTEXT

1.4 EU Rail Freight Corridors (RFCs) – (cont.)



I. POLICY CONTEXT

CNCs and RFCs – two corridor concepts complementing each other

Core Network Corridors (CNC)	Rail Freight Corridors (RFC)
Multimodal (rail, road, aviation, inland waterways and ports)	Rail transport
Passenger and freight traffic	Freight focus
Only Core Network lines	Core Network lines, Comprehensive Network lines and non-TEN-T lines
Mainly oriented at infrastructure	Mainly oriented at traffic operations and administrative processes
One EU Coordinator per CNC	Dedicated, permanent governance structure for each RFC
	One RFC in each CNC

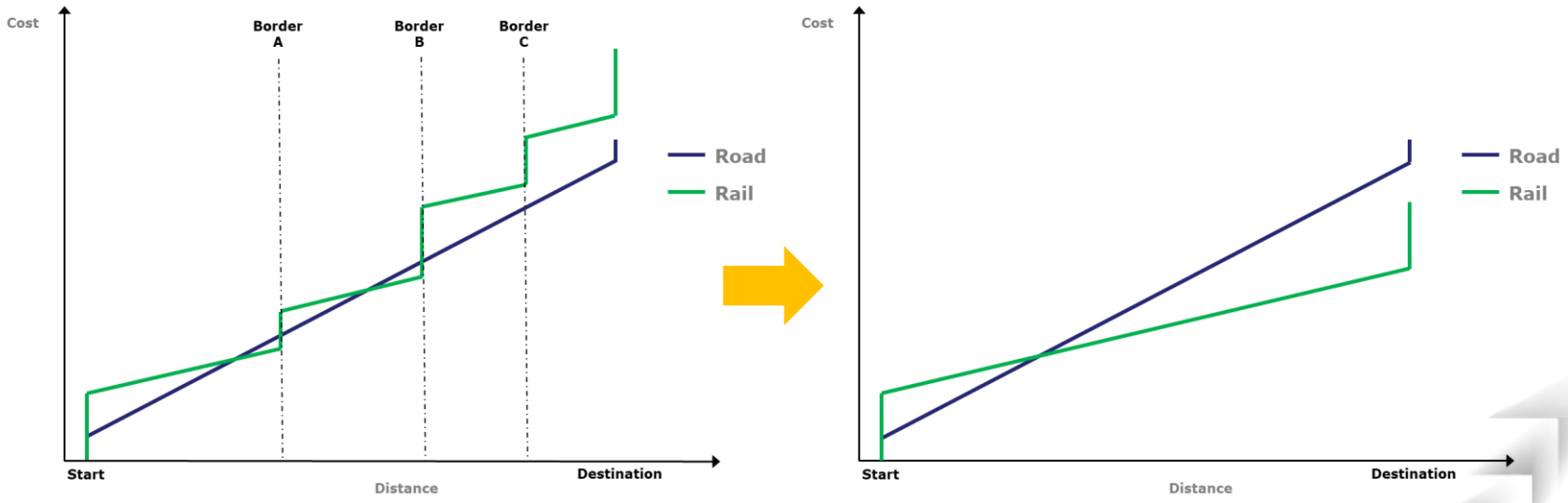
II. MARKET REQUIREMENTS AND CHALLENGES IN EUROPEAN RAIL FREIGHT

- **Quality challenge** – punctuality and reliability of rail freight services to be improved
- **Cost challenge** – cost competitiveness to be strengthened through higher efficiency in production processes and a level playing field between modes
- **Service challenge** – new service features necessary in rail freight to enter into new market segments
- **Political and societal challenge** – ensuring support for developing rail freight, addressing noise issue

II. MARKET REQUIREMENTS AND CHALLENGES IN EUROPEAN RAIL FREIGHT – (cont.)

- **A „European" challenge** – overcoming borders and achieveing a truly Single European Rail Area

Single European Rail Area - Impact on rail's competitivness



III. SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS IN THE CONTEXT OF RAIL FREIGHT DEVELOPMENT

3.1 Definition

- Term refers partly to
  - the physical size of a project, e.g. its spatial extension
  - the investment volume
- Qualification as small-scale low-cost to discern projects from large-scale projects which are in a „league of their own", e.g.:
  - Base tunnel CZ-DE under the Erzgebirge mountain ridge
  - New high-speed lines in CZ
- Typically local projects, limited to a certain yard, station, terminal or (shorter) line section and an investment volume of up to a medium two-digit number of million Euros

III. SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS IN THE CONTEXT OF RAIL FREIGHT DEVELOPMENT

3.2 Role and importance

Small-scale low-cost projects have an – often underestimated – potential to contribute to the development of the rail freight system. They can:

- ✓ deliver quick benefits, since planning and implementation often can be carried out faster than for large-scale projects
- ✓ deliver tangible improvements at a relatively low cost – major improvements in rail freight are often already possible with rather moderate investments (compared to passenger traffic)
- ✓ strengthen the added value of large-scale infrastructure improvements – a corridor-oriented planning and investment approach is of particularly high value

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.1 Signalling measures

- Harmonised (and short) length of block sections
- Shortening of block sections around stations
- Double-track lines: full signalisation of both tracks for both directions (allowing unrestricted bi-directional use of both both tracks)
- Single-track lines: Simultaneous entry to crossing stations

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

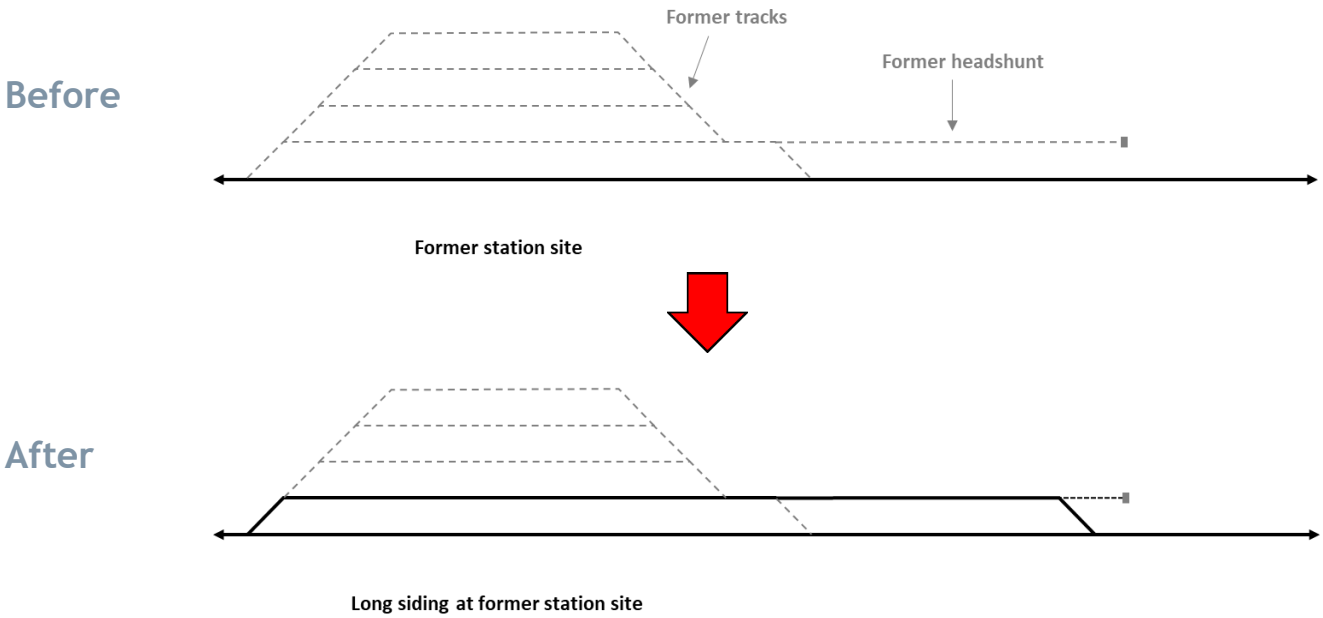
4.2 Extension of sidings

- Crucial for enabling longer freight trains (target: ≥ 740 m)
- Relevant for
  - Terminals, where trains are loaded/unloaded
  - Train formation facilities (freight yards)
  - Sidings „out on the line” for crossing/overtaking of trains

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.2 Extension of sidings – (cont.)

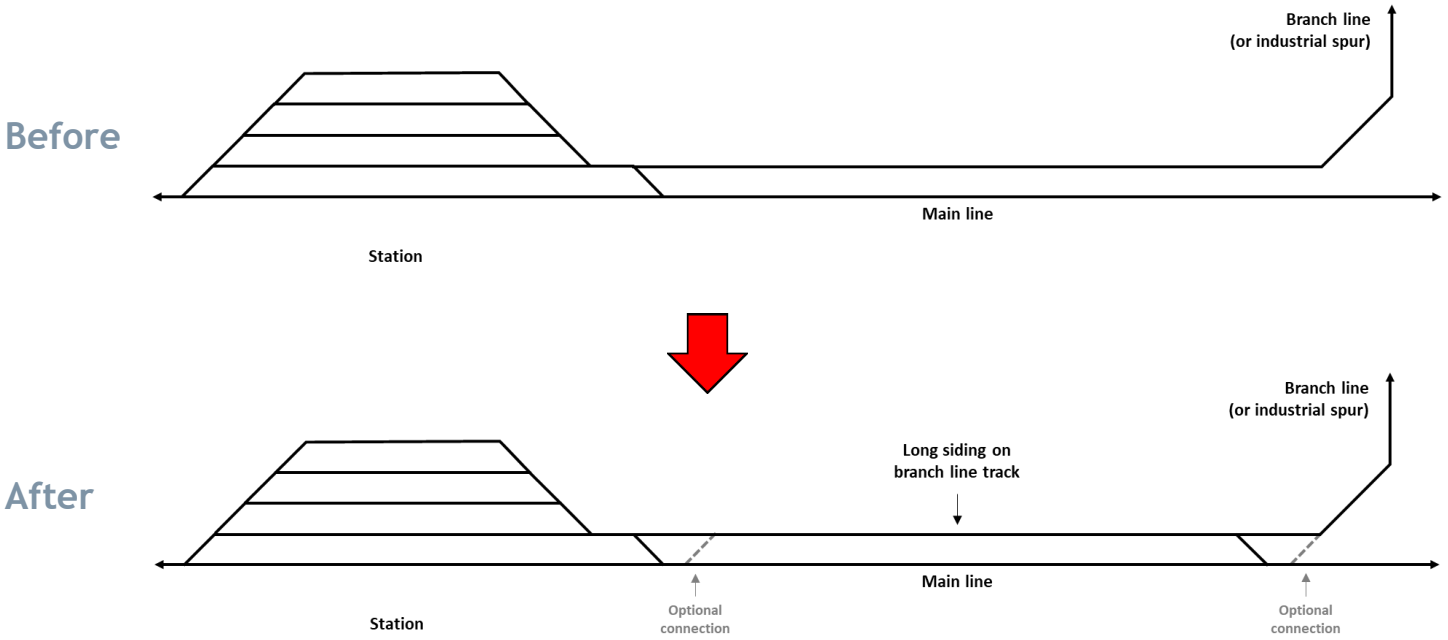
- Cost-efficient solutions: Sidings at former or reduced station sites



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.2 Extension of sidings – (cont.)

- Cost-efficient solutions: Using parallel tracks of branch lines and industrial spurs



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

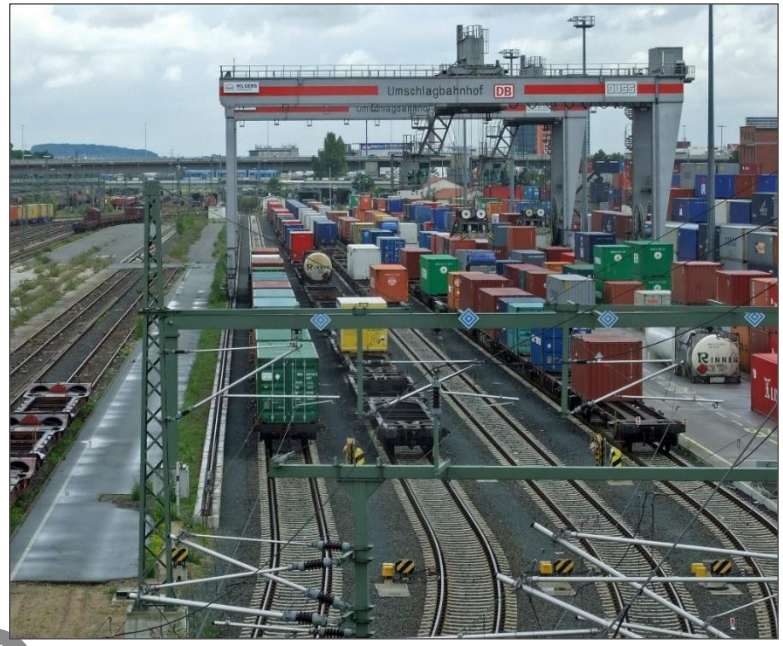
4.3 Terminals

- Extension of arrival/departure tracks
- Extension of handling tracks
- Electrifying end sections of handling tracks – avoiding shunting with diesel locomotives
- Adapting track layout for „momentum entry" of trains (using the kinetic energy of moving train to enter non-electrified handling tracks)
- Connection of terminals to main line in *both* ends – enabling new operating methods

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.3 Terminals – (cont.)

- Example: Electrifying end sections of handling tracks – avoiding shunting with diesel locomotives



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

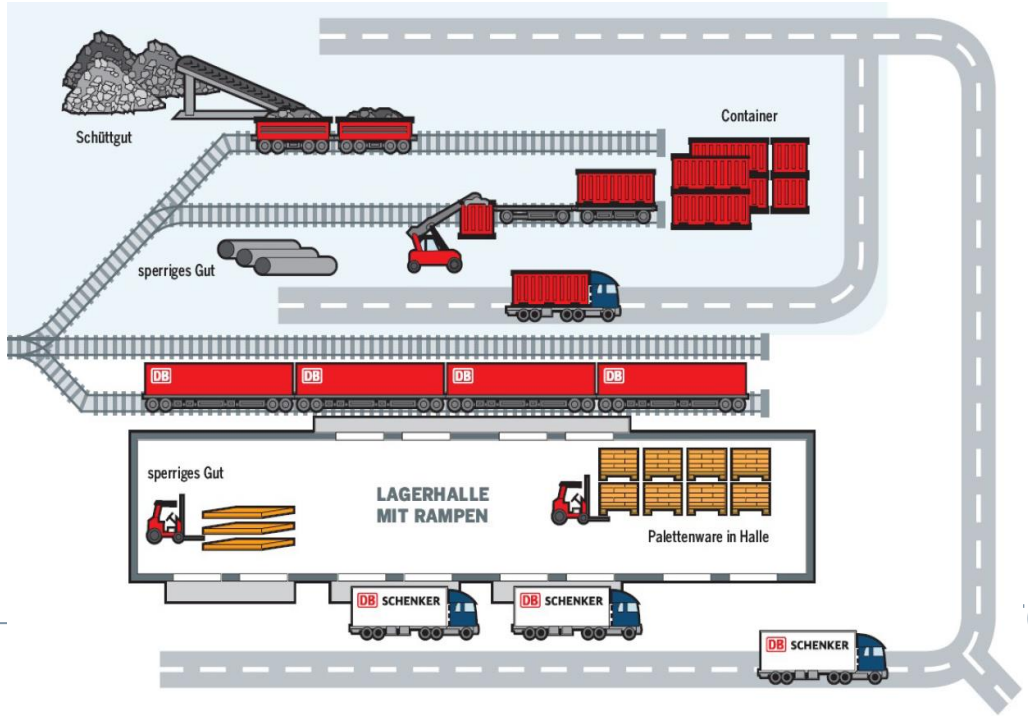
4.3 „Levels" of improvement for terminals

Level	Feature / measure	Impact on efficiency of terminal operations / competitiveness of intermodal transport	Comment
1	≥ 740 m long arrival and departure tracks (not necessarily identical to handling tracks)	+	Minimum requirement to receive trains making use of TEN-T infrastructure parameters
2	= Level 1, plus: ≥ 740 m long handling tracks	++	Leading to improved cost and time efficiency of terminal operations, reducing need for shunting operations (no splitting of trainsets)
3	= Level 2, plus: Direct entry and exit to/from handling tracks from/to main line (at one end)	+++	Leading to improved cost and time efficiency of terminal operations, reducing further – and partly eliminating – need for shunting operations
4	= Level 3, plus: Handling tracks at each end connected to main line	++++	Leading to improved cost and time efficiency of terminal operations, reducing further – and potentially eliminating – need for shunting operations; Creating possibilities for new production models in intermodal transport (liner trains with intermediate stops)

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.3 Terminals – Multifunctional terminals

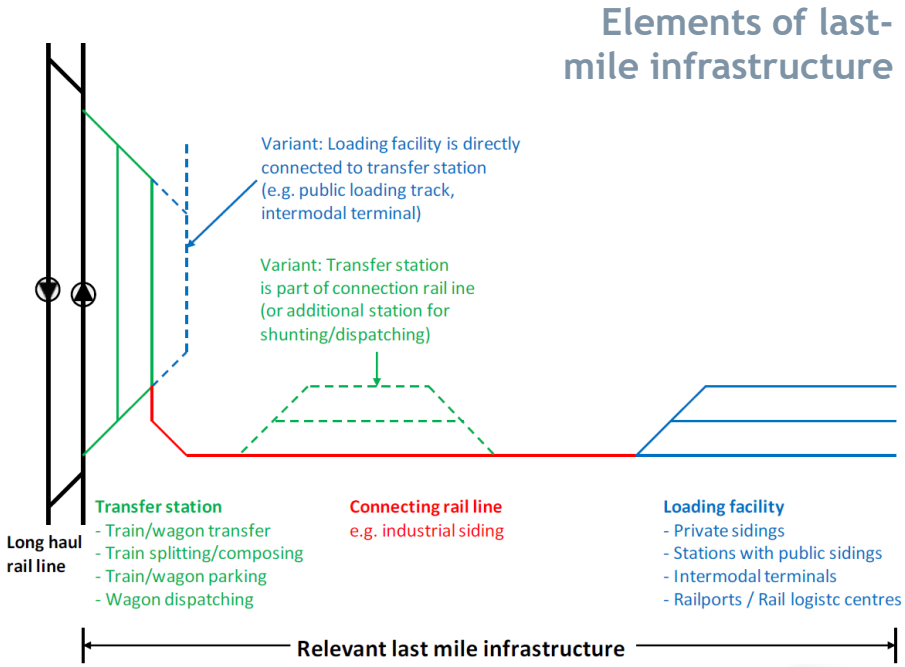
- Increasing the traffic base of a terminal through combined terminals for intermodal and non-intermodal cargo (“Railports”)



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.3 Last-mile infrastructure

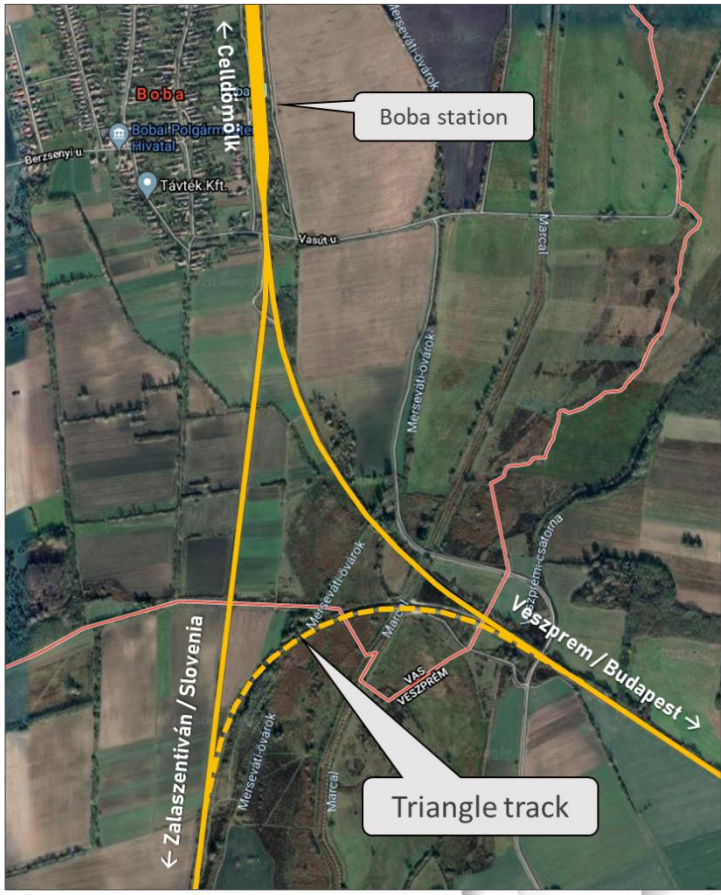
- Modernisation of last-mile infrastructure to today's needs
- Planning and adapting last-mile infrastructure to new localisation patterns
- Planning and financing challenges
- Support programs for last-mile infrastructure



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.4 Triangle tracks

- Avoiding changes of travelling direction, incl. related operational processes:
  - Decoupling of loco
  - Moving loco to other end of the train
  - De-coupling of loco
  - (Simplified) brake test
- Potential to use infrastructure in stations concerned for other purposes (or reduce infrastructure)



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.5 Freight by-passes

- Separating freight and passenger traffic in major conurbations
- Removing freight traffic from central parts of a city

Example:
Freight by-pass Hannover

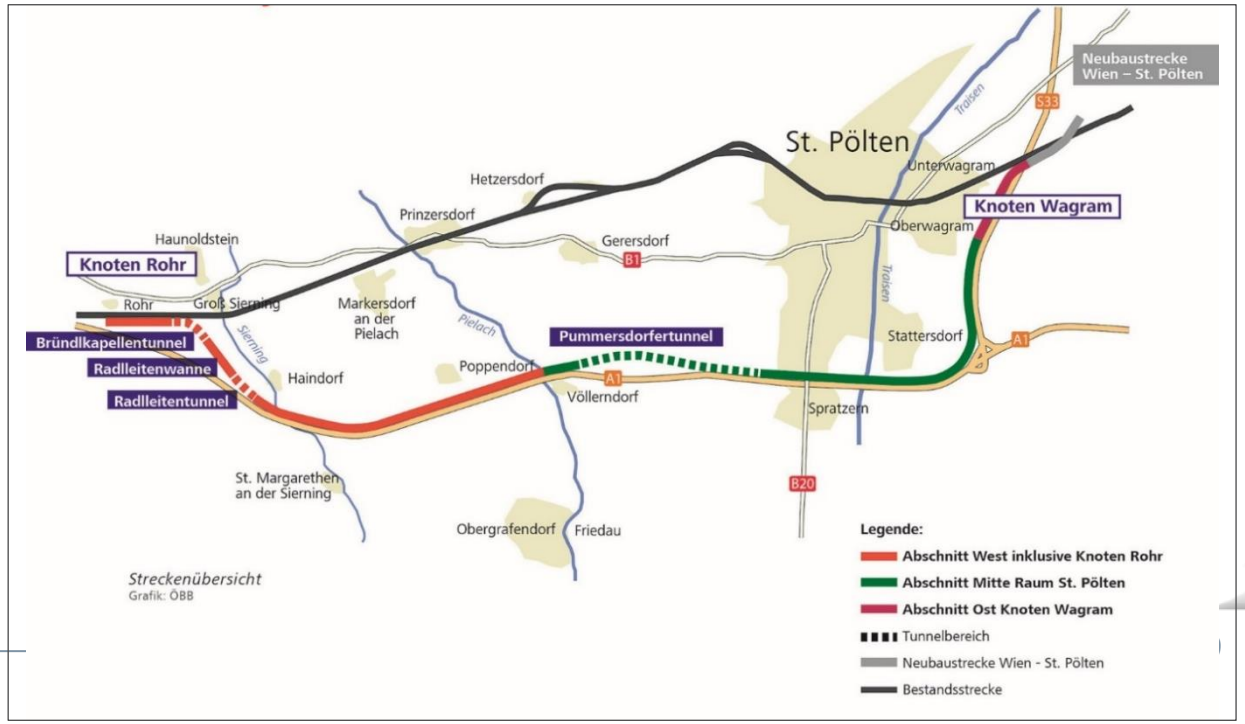
IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.5 Freight by-passes

→ Freight by-passes are not necessarily small-scale low-cost (!)

(depends highly on length of the line and topography of the area)

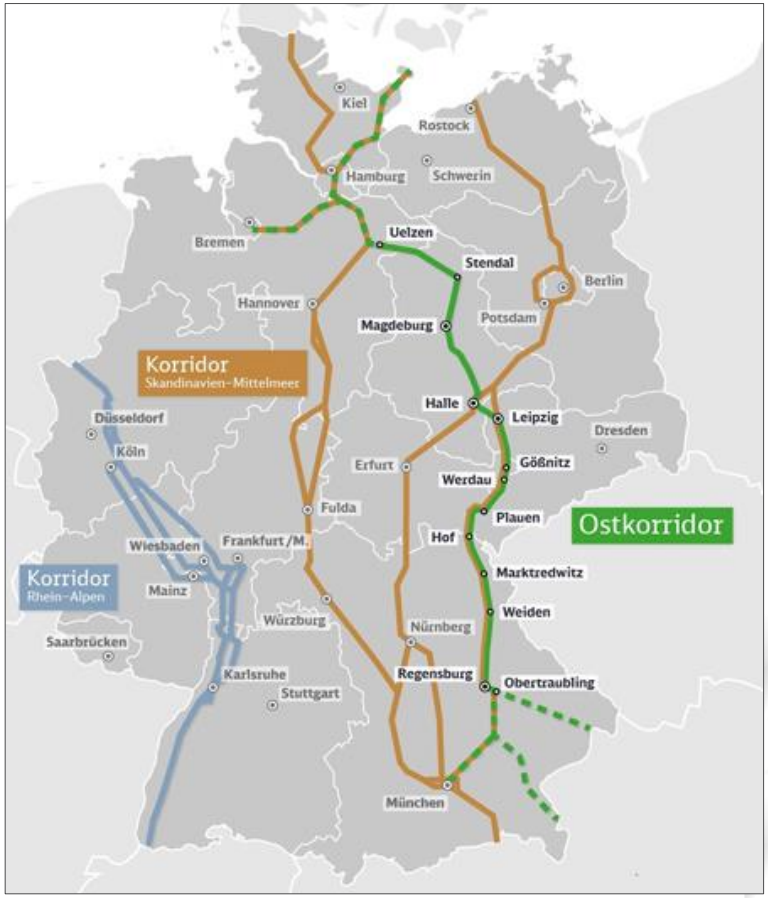
Example: Freight by-pass St. Pölten



IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.6 Alternative routes through combination of secondary lines

- Creating additional capacity and/or allowing partial separation of freight and passenger traffic
- Technical standard of line sections to be harmonized (and often to be raised)
- Suitable if under-utilized parallel lines exist or can be modernized more easily

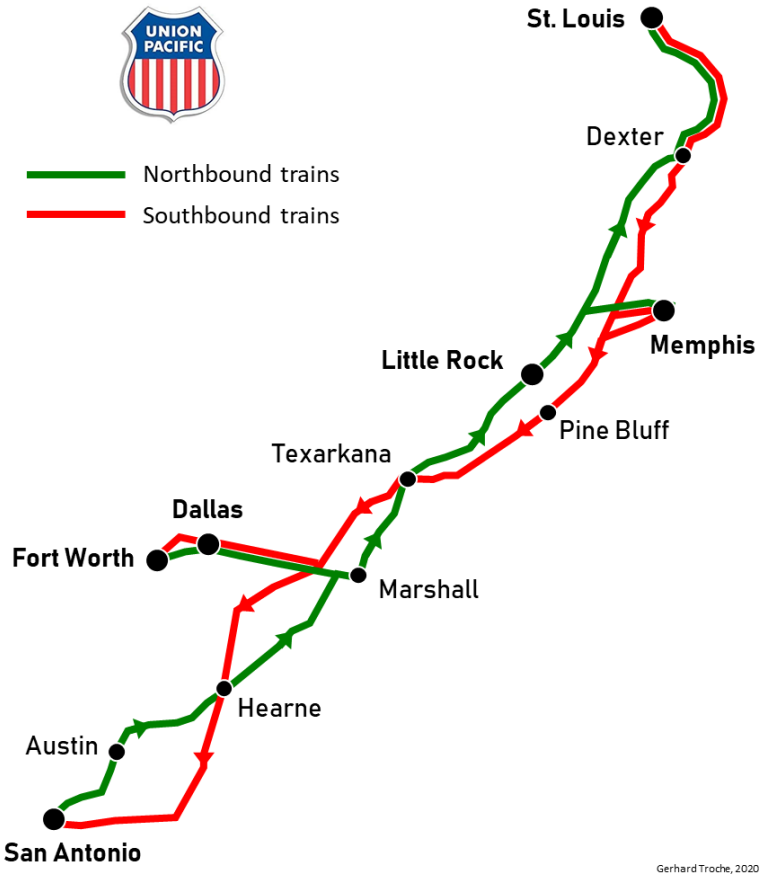


Example: „Ostkorridor" for port-hinterland traffic in Germany

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.6 Operational measure – directional running

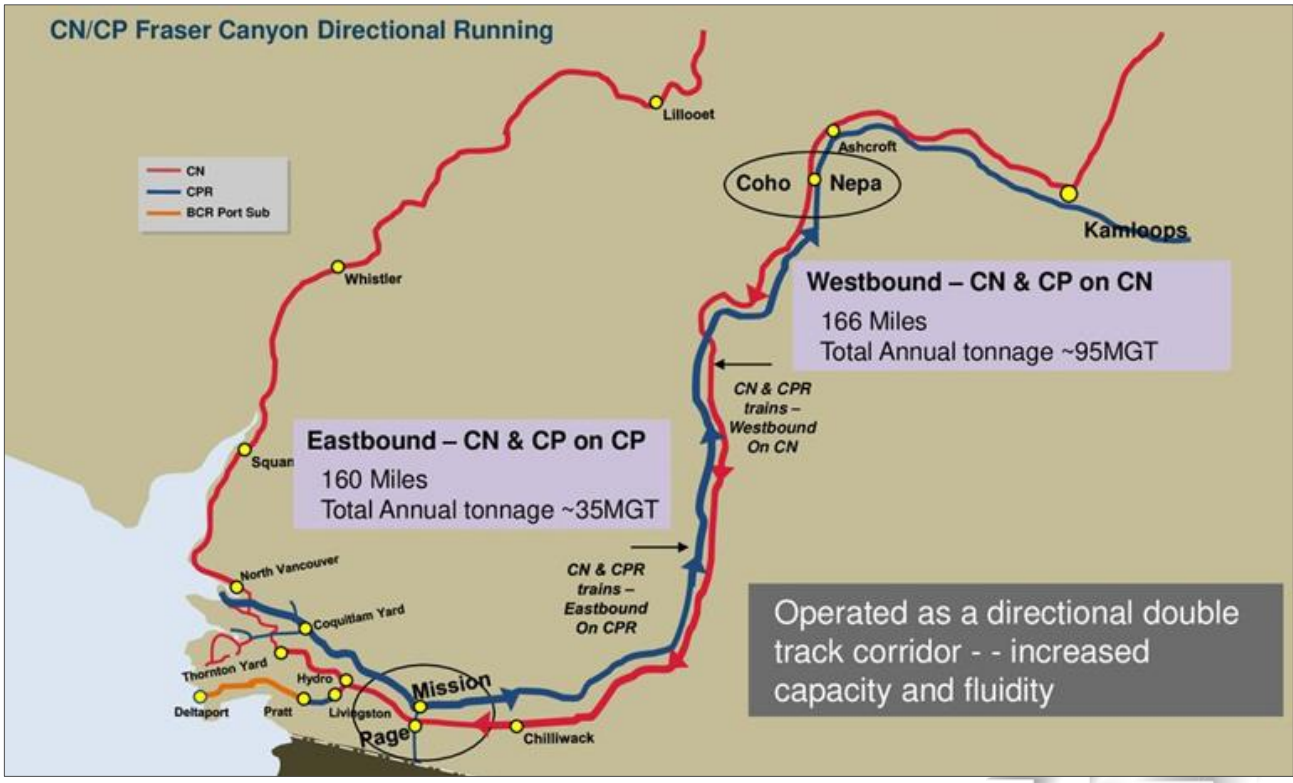
- Suitable to achieve „double-track" effect through unidirectional operation of parallel single-track lines
- Suitable for freight – not for passenger traffic!



Example:
Directional running in US

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

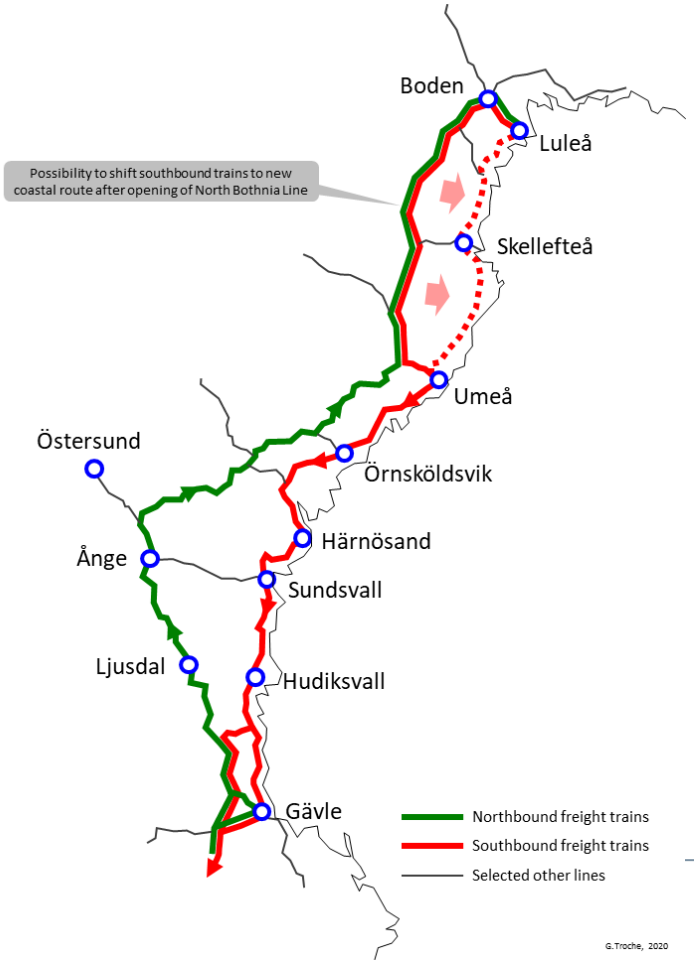
4.6 Operational measure – directional running (cont.)



Example:
Directional running in Canada

IV. MEASURES FOR SMALL-SCALE LOW-COST INFRASTRUCTURE IMPROVEMENTS

4.6 Operational measure – directional running (cont.)



Example:
Directional running in Europe (Sweden)

V. BETTER INCLUSION OF RAIL FREIGHT IN REGIONAL AND SPATIAL PLANNING

5.1 Problem areas

- Generally little attention given to freight transport and logistics in spatial and regional planning
- In rail clear priority given to (local and regional) passenger transport
- Lack of awareness of the role and importance of rail freight and its potential to contribute to a sustainable transport system and society
- Lack or knowledge about the “functioning” of rail freight and its specific needs
- Weak contacts between regional planners and the railway sector
- Public opinion against rail freight („NIMBY”-attitude)

V. BETTER INCLUSION OF RAIL FREIGHT IN REGIONAL AND SPATIAL PLANNING

5.2 Solution approaches / areas of action

- Knowledge-building
- Network building between rail sector and planners
- Elaboration of „guidelines" for planning for rail freight
- Tackling rail freight issues in joint projects (e.g. Interreg-projects)
- Protecting land for railway purposes (even if currently not used!)
    - Station and terminal sites
    - Railway lines

CONCLUSIONS

- Developing small-scale low-cost project ideas for rail freight
- Feed projects into CNC-Work Plans and regional/spatial planning
- Coordinating projects in regions / along corridors (even-cross border)
- Exploiting potential to „merge" smaller projects into multi-location funding applications

NEXT STEPS

- Applying system approach to the Brno – Budapest section of the OEM-corridor (D.T2.3.8)
- CORCAP Demonstration Train (probably 19/20 Mai 2021 (D.T2.3.9), together with Partner and Stakeholder workshop
- Elaboration of guideline (D.T2.3.10)
- Feeding outcome into:
  - Corridor Capitalisation Plans
  - CNC Work Plans
  - National and regional infrastructure and spatial planning
  - Elaboration of funding applications

THANK YOU !

GYSEV Raaberbahn