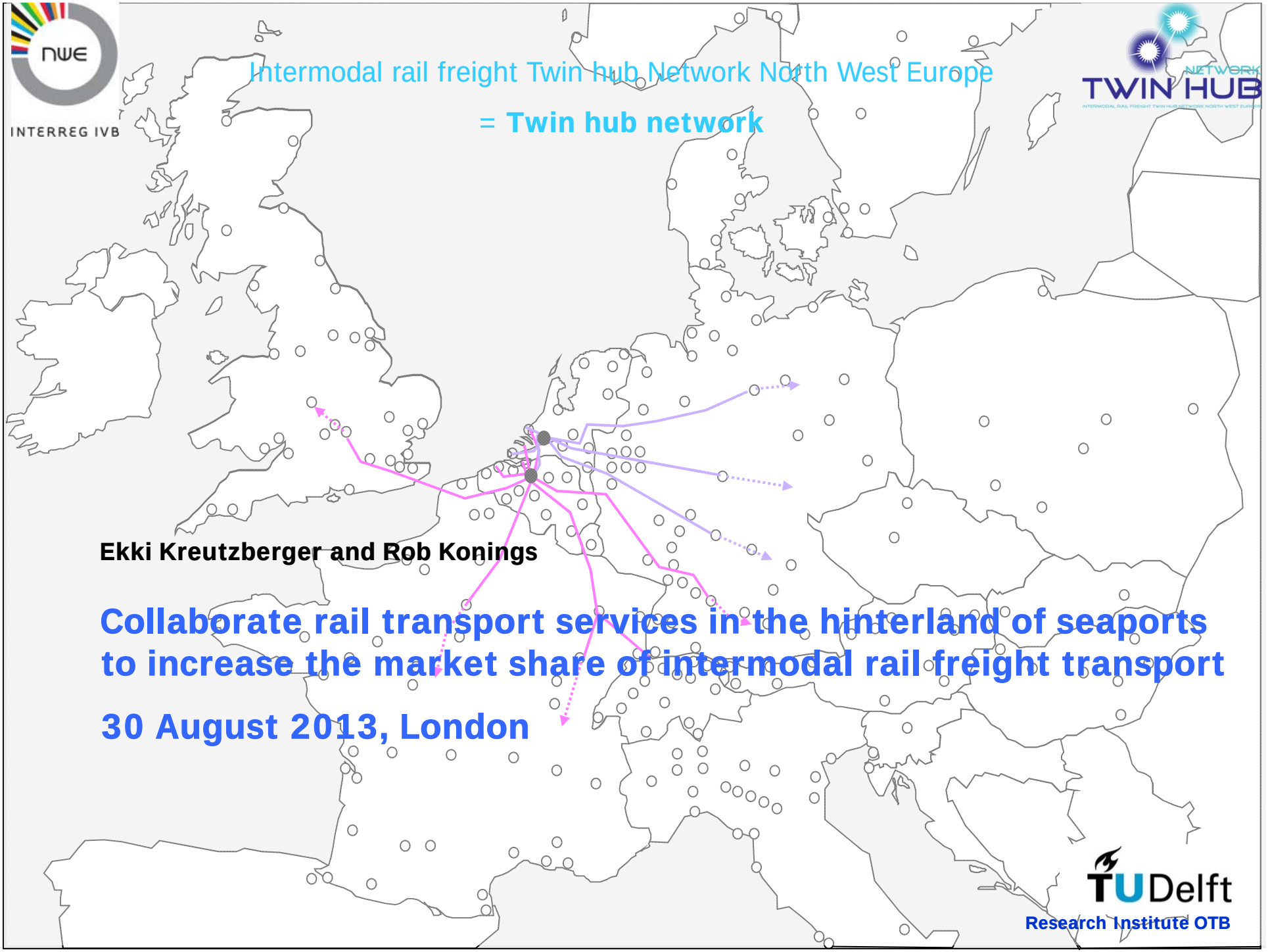


Ekki Kreutzberger and Rob Konings

Collaborate rail transport services in the hinterland of seaports to increase the market share of intermodal rail freight transport

30 August 2013, London

TU Delft
Research Institute OTB

Content of presentation

- General intermodal challenge
- The bundling challenge
- Twin hub concept
- Twin hub concept: the intention of seamless
- Twin hub project: testing the idea (of seamless transport) in a pilot
- Conclusions

Challenge (intermodal) transport

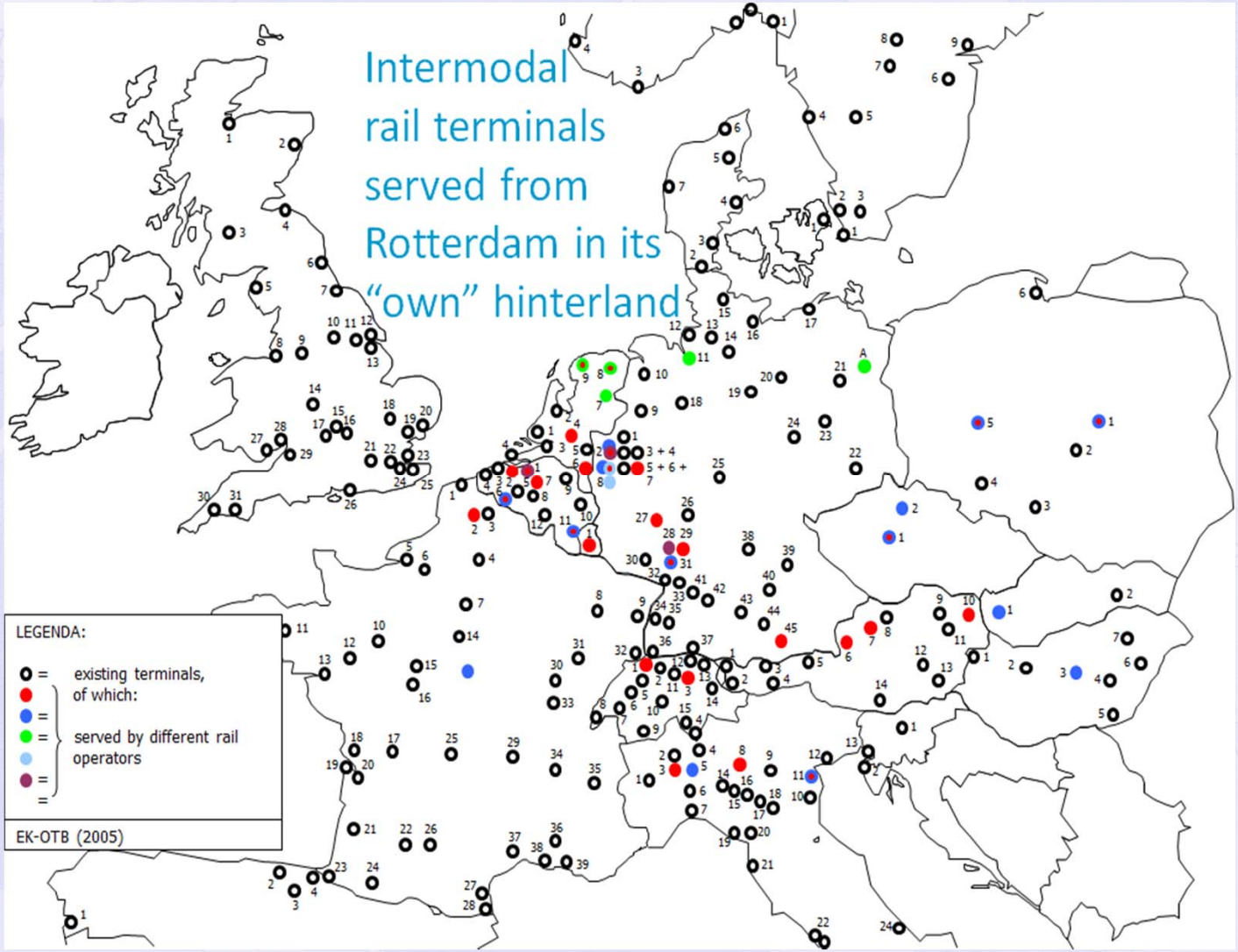
Intermodal rail transport is highly relevant

- High growth rates of freight transport (50% between 2000 and 2020)
- Impossible to accommodate growth mainly by truck transport
  (current share is about 75% in the EU)
- Rail transport is relatively? sustainable (e.g. climate, pollution, noise, accidents, infrastructure, space)
- Societal aims: increase share intermodal rail and barge transport
  In Rotterdam the aim is to increase rail share from 11% to 20% in 2033. In Antwerp to 15% in 2020.
- Commercial aims: Intermodal rail transport is a growth market for the railway sector

Intermodal rail transport is only modestly competitive

- Growth share intermodal rail transport is hampering
- Good quality only (according to the European project IQ):
  - In corridors with large flows
  - From and to large nodes
  - In some well organized regions
- Rail is typically chosen because of low costs, but numerous railway companies / intermodal rail operators cannot cover their costs
- Capacity restrictions in rail network at large nodes,
  in large seaports in particular

Illustration low quality for indicator network connectivity



Conclusion for intermodal transport: Operational improvements

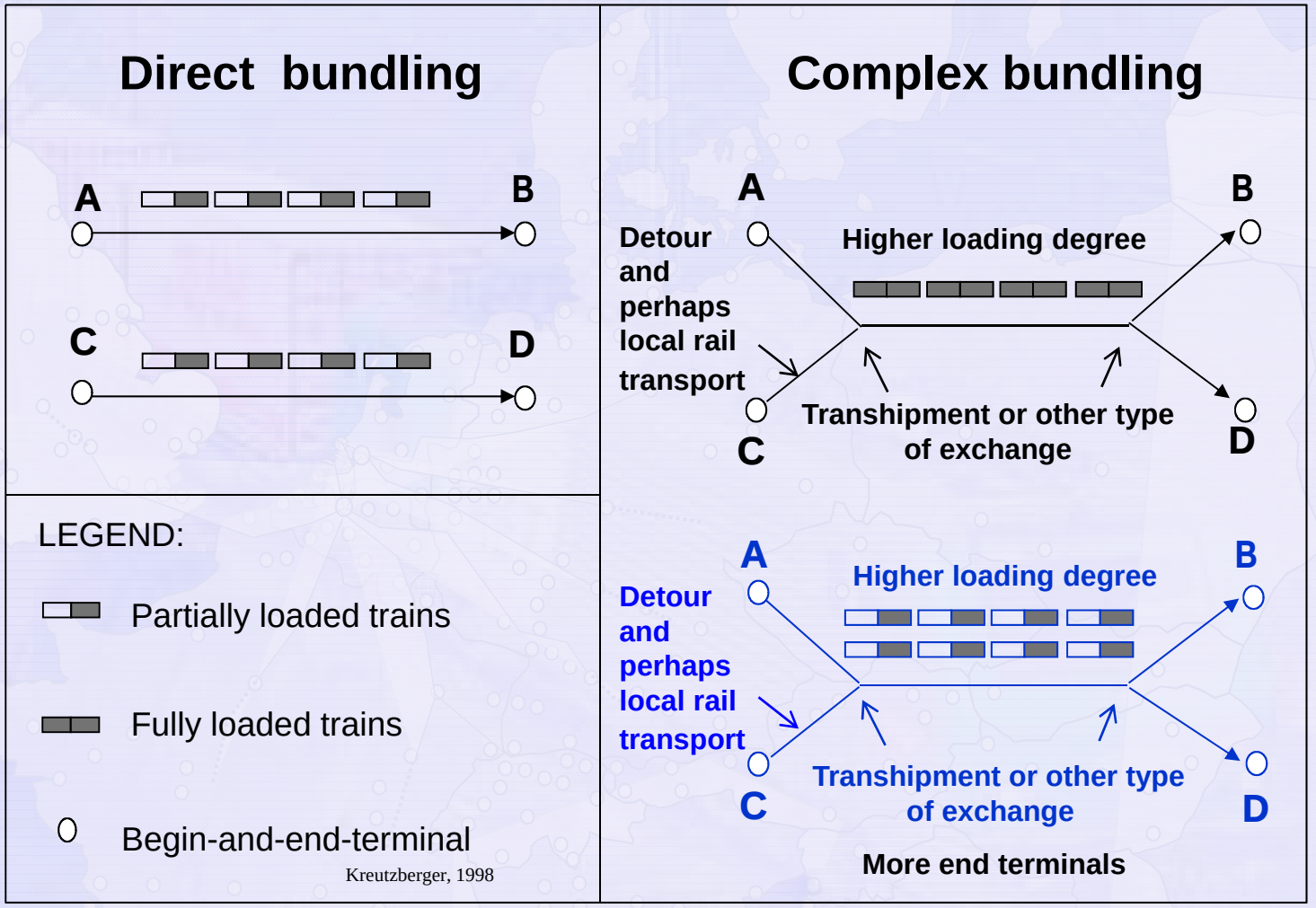
Continuously in search for appropriate innovations:

- Network design (mainly services):
  - **Bundling of rail flows and scale of transport**
  - Train roundtrips
  - Pre- and post-haulage
  - Spatial organization (locations of terminals and customers)
- Node design (services and infrastructure)
- Vehicle design
- Business and organisational design

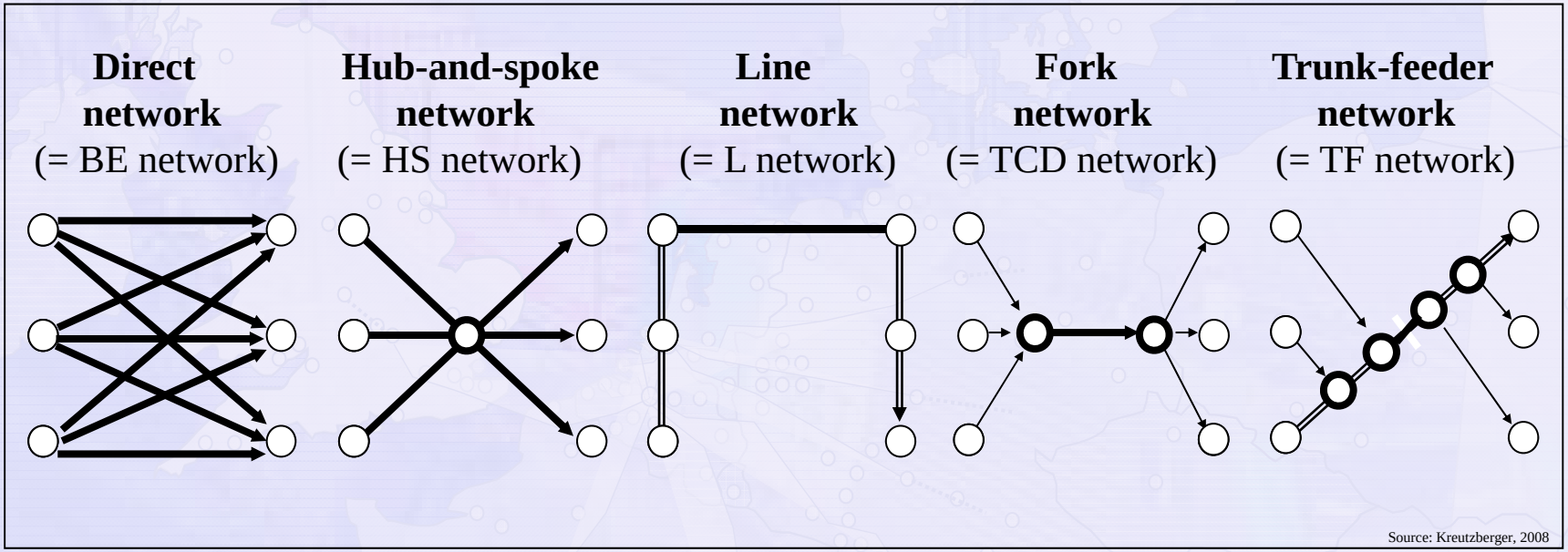
The bundling challenge

Basic bundling choices

- Many intermodal rail flows are too small for direct train services ...
- ... also from and to large nodes
- “Complex bundling” is required for many relations



Basic bundling choices



Only trunk rail network (with full trainloads)

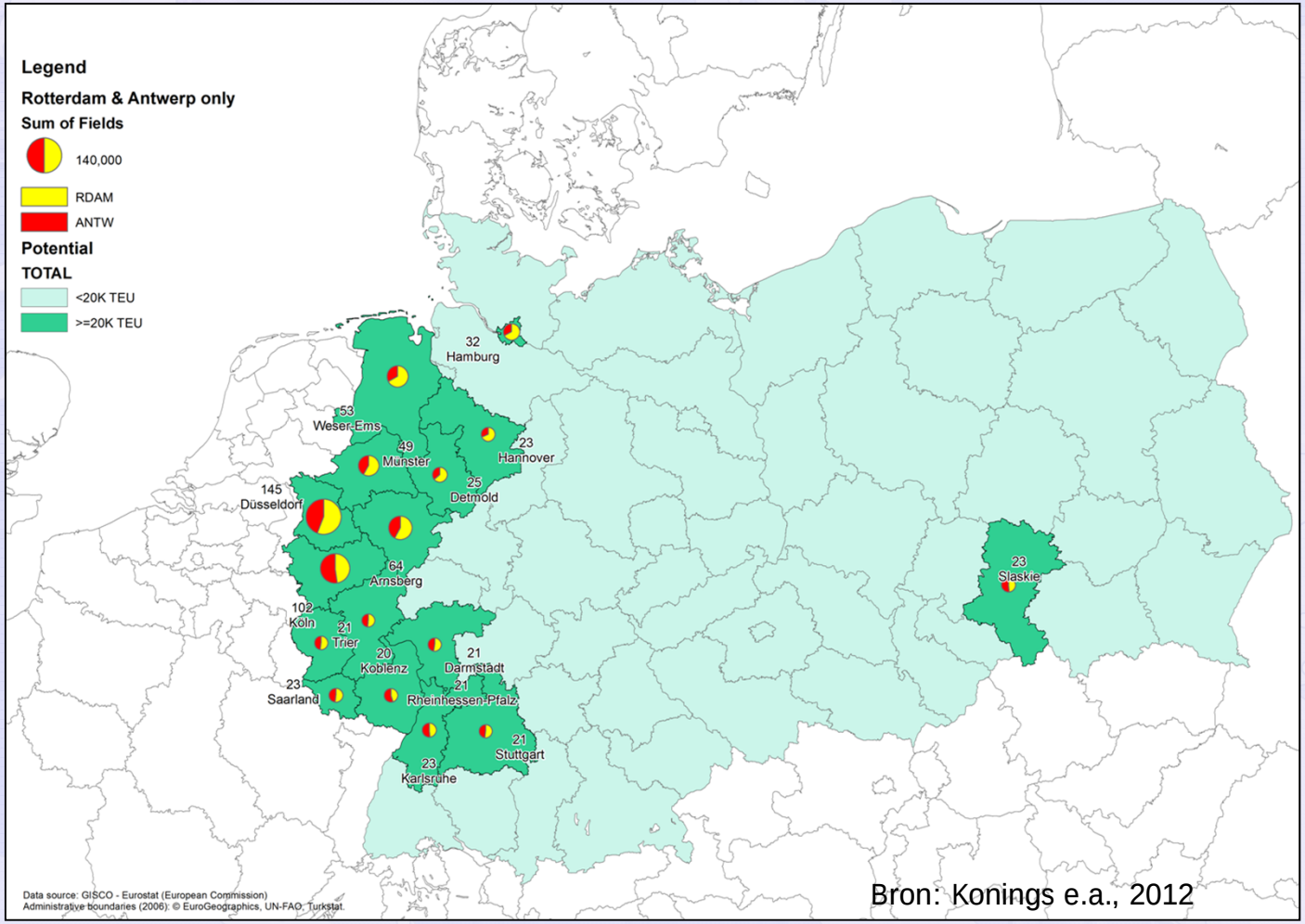
Trunk rail and local rail network (with full and small trainloads)

Twin hub concept

Twin hub concept

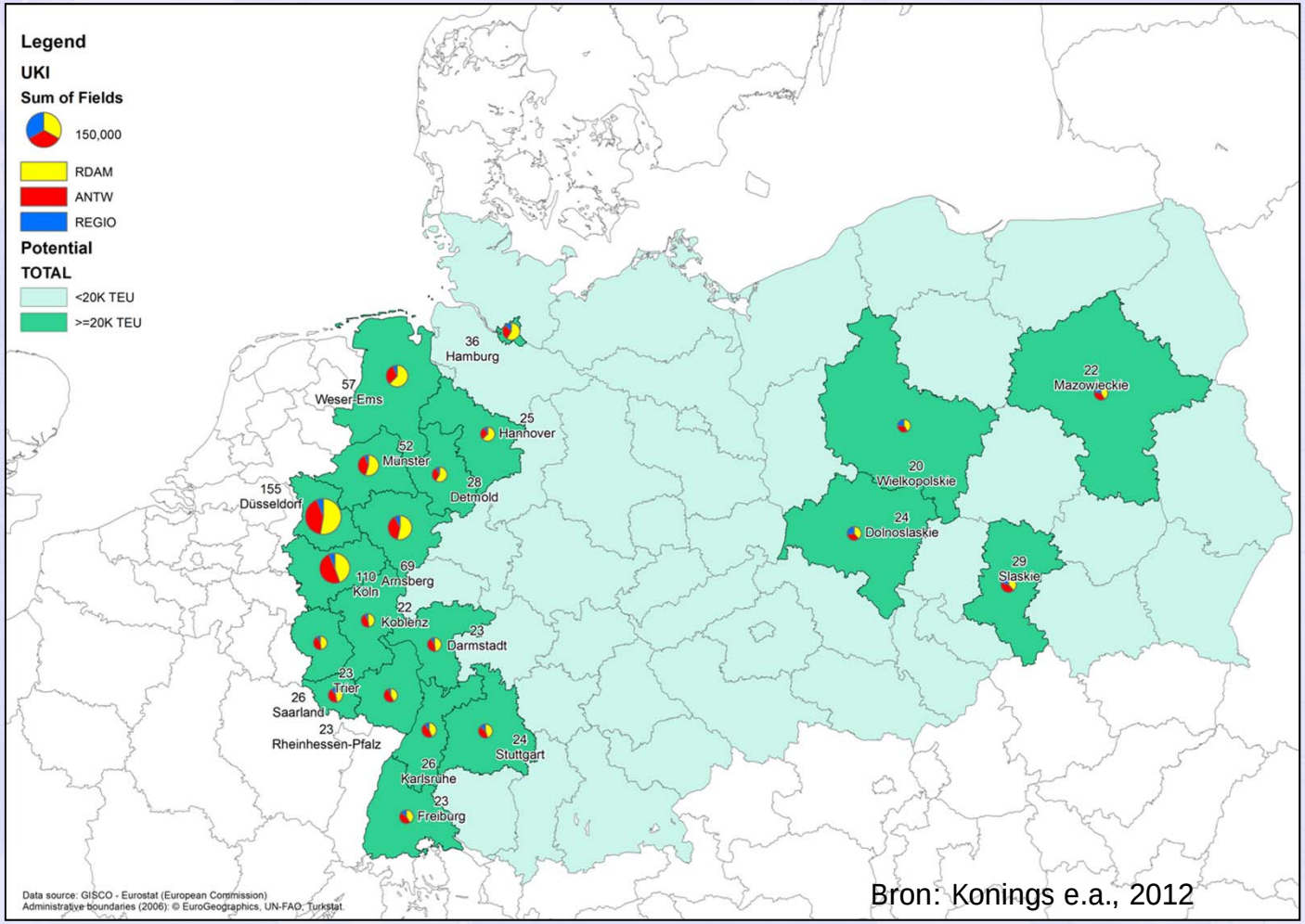
- Bundle rail flows of Rotterdam and Antwerp and of smaller seaports
  - Transport Dutch load units in Antwerp trains wherever they have or could have a strong market position
  - Transport Belgian load units in Rotterdam trains wherever they have or could have a strong market position
  - Complementary corridors in acknowledgement of seaport competition
  - Move load units between inland terminals and different ("west") seaports in the same train
- Organize such bundling by means of hub-and-spoke- (= HS-) networks
- Two hubs, in regions Antwerp and Rotterdam (= gravity points of flows)
- The Twin hub concept enlarges the service area of each hub increasing the advantages of HS bundling

Regions that can be served by Twin hub services (in 1.000 TEU) between seaports **Rotterdam / Antwerp** and Germany / Czech republic / Poland, 2010



Bron: Konings e.a., 2012

Regions that can be served by Twin hub services (in 1.000 TEU) between seaports Rotterdam / Antwerp / Greater London and Germany / Czech republic / Poland, 2010



Bron: Konings e.a., 2012

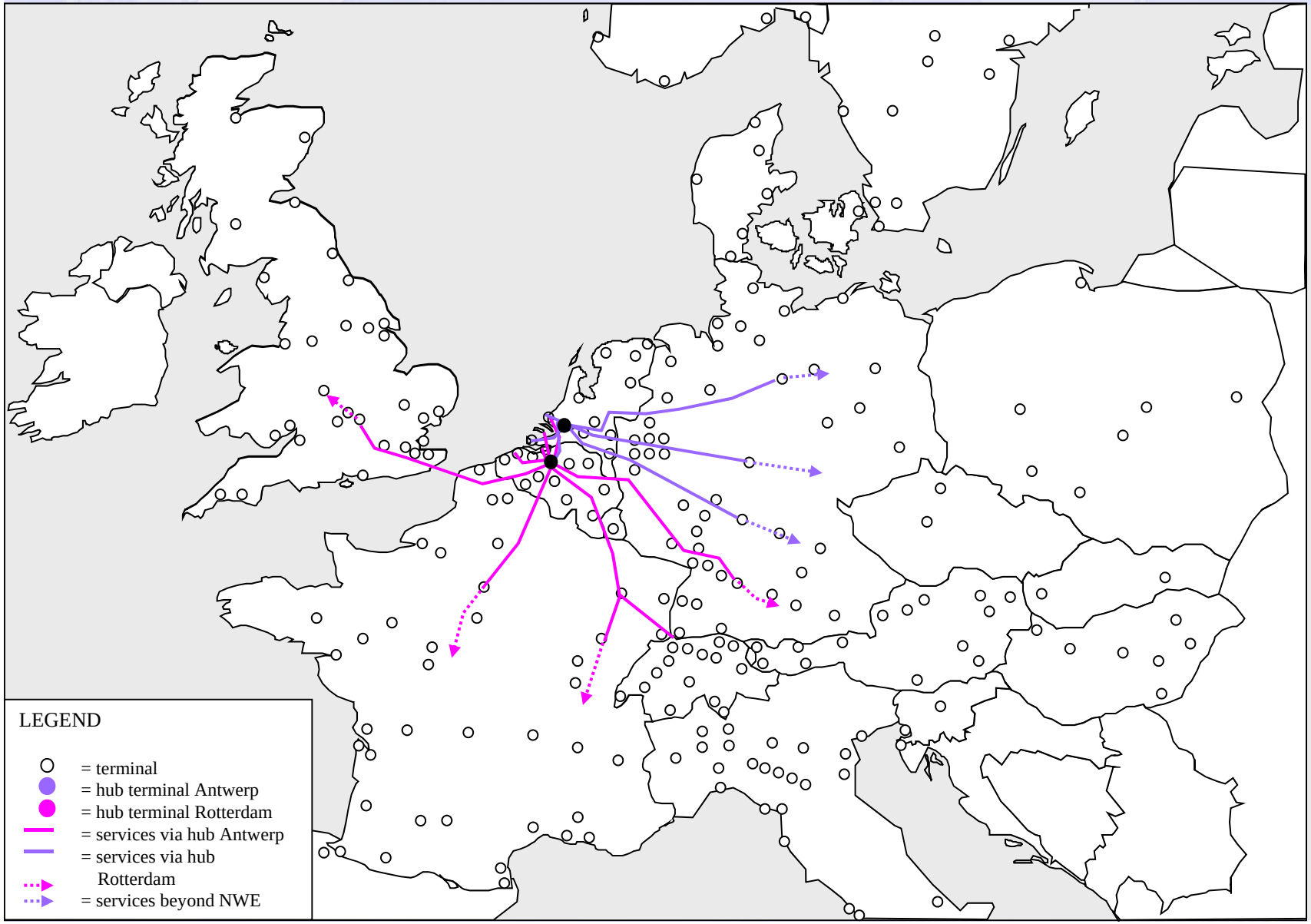
Twin hub project:

The intention of seamless

Twin hub concept, seamless 1

- Bundling by means of HS networks (**seamless: only trunk and no local rail networks, hence less interfaces**)
- Hubs in gravity points of flows: regions Rotterdam and Antwerp
- Service area of both hubs overlap:
  - Let Dutch containers go by Antwerp trains, wherever ...
  - Let Belgian containers go by Rotterdam trains, wherever ...

Twin hub concept, seamless 1



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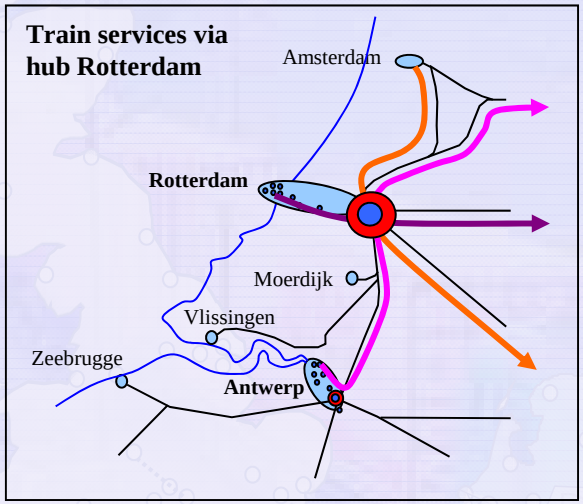
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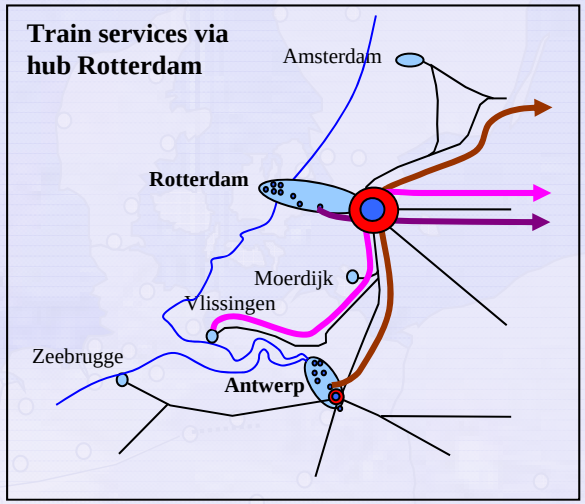
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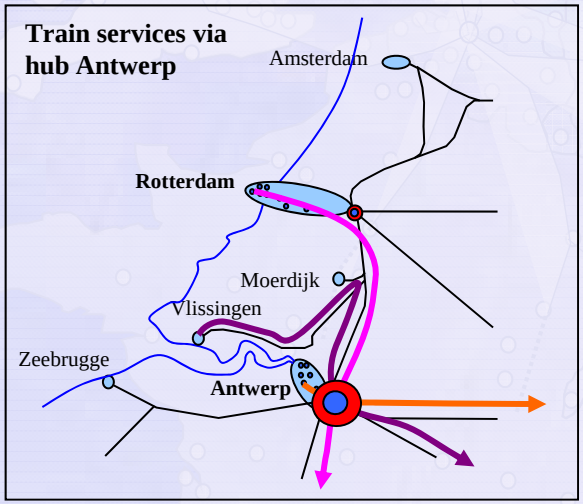
Twin hub concept, seamless 2

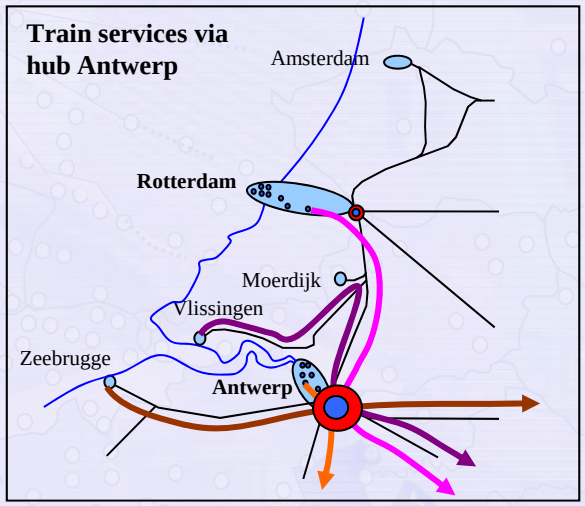
- Each train and container only visits 1 hub per journey (**seamless: less interfaces**)
- Ideally the trains of an exchange batch visit the hub simultaneously (**seamless:** less exchange via terminal storage area and hence **less impedance at interface**)

Twin hub concept, seamless 2









LEGEND= train services to/from European inland terminals

Seamless 3: no shunting of single wagons at the hub

Shunting of wagons (formerly including containers)

Crane transhipment of containers at a terminal



Twin hub concept, seamless 3

- 3 alternatives at the hub: exchange of containers between trains by:
  1. Shunting of single wagons (time consuming and expensive)
  2. Shunting of wagon groups (only suitable if flows are large enough for wagon groups)
  3. Transhipment of containers

- Avoid 1. 3 is best. (seamless: lower impedance at interface)

Twin hub concept, seamless 4

- Cooperation between competitors
  - seaports
  - countries
  - intermodal rail operators

Currently: Intermodal hub-and-spoke bundling by train is typically restricted to:

- seaports within 1 country
- 1 rail firm or ”family” of rail firms

Twin hub project:

Testing the idea (of seamless transport) in a pilot

Twin hub concept, seamless 1 and 3

- Bundling by means of HS networks (1) **seamless? YES**
- No single wagon shunting. Preferably transhipment at terminal hub (2). **Seamless? YES**

Twin hub concept, seamless 2a

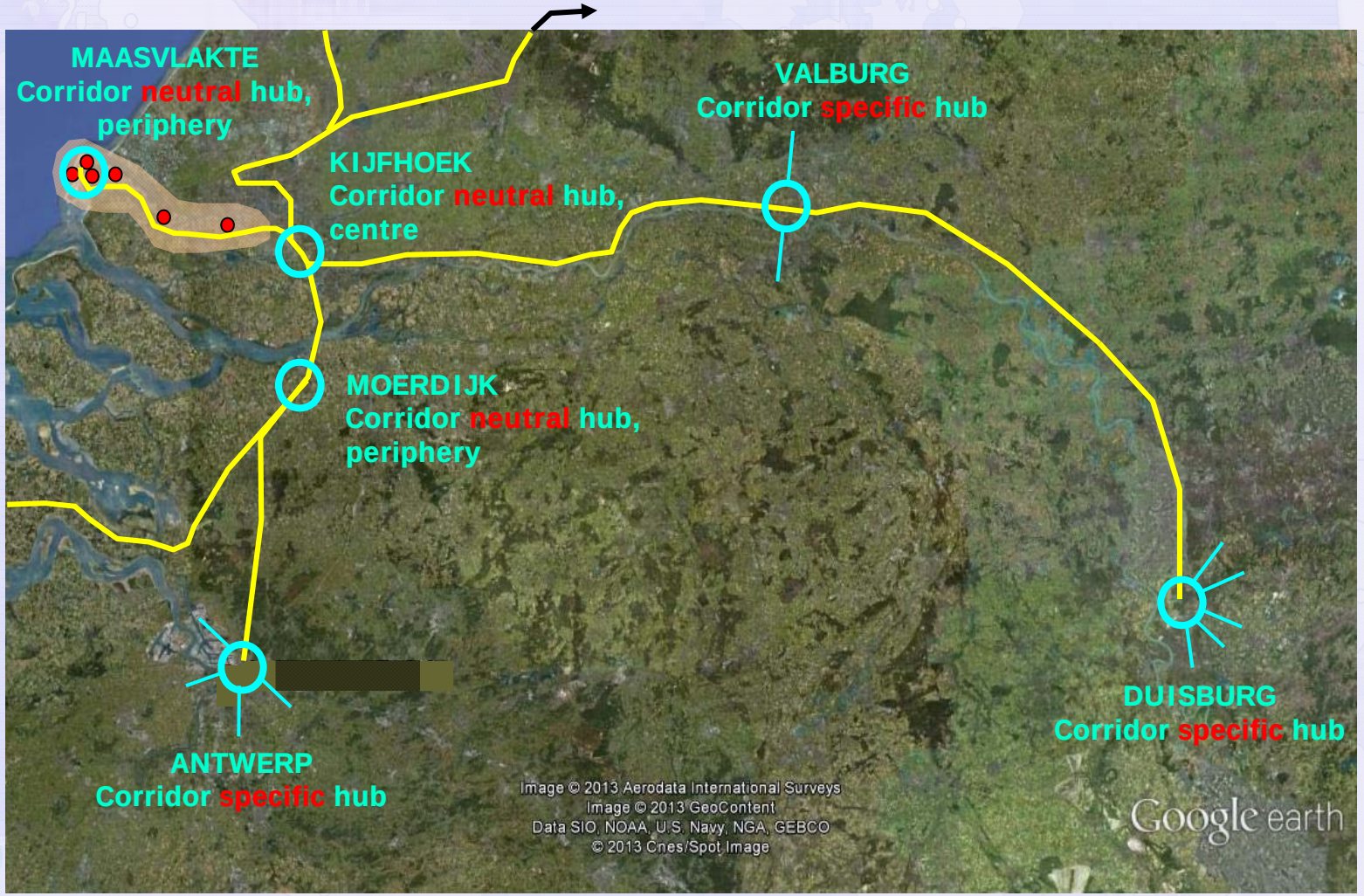
- Ideally the trains of an exchange batch visit the hub simultaneously ?

Seamless? NO

- No hub infrastructure suitable for the pilot available in Rotterdam
- Within short: also not in Antwerp

- Suboptimal operations: including no simultaneous, but sequential hub exchange

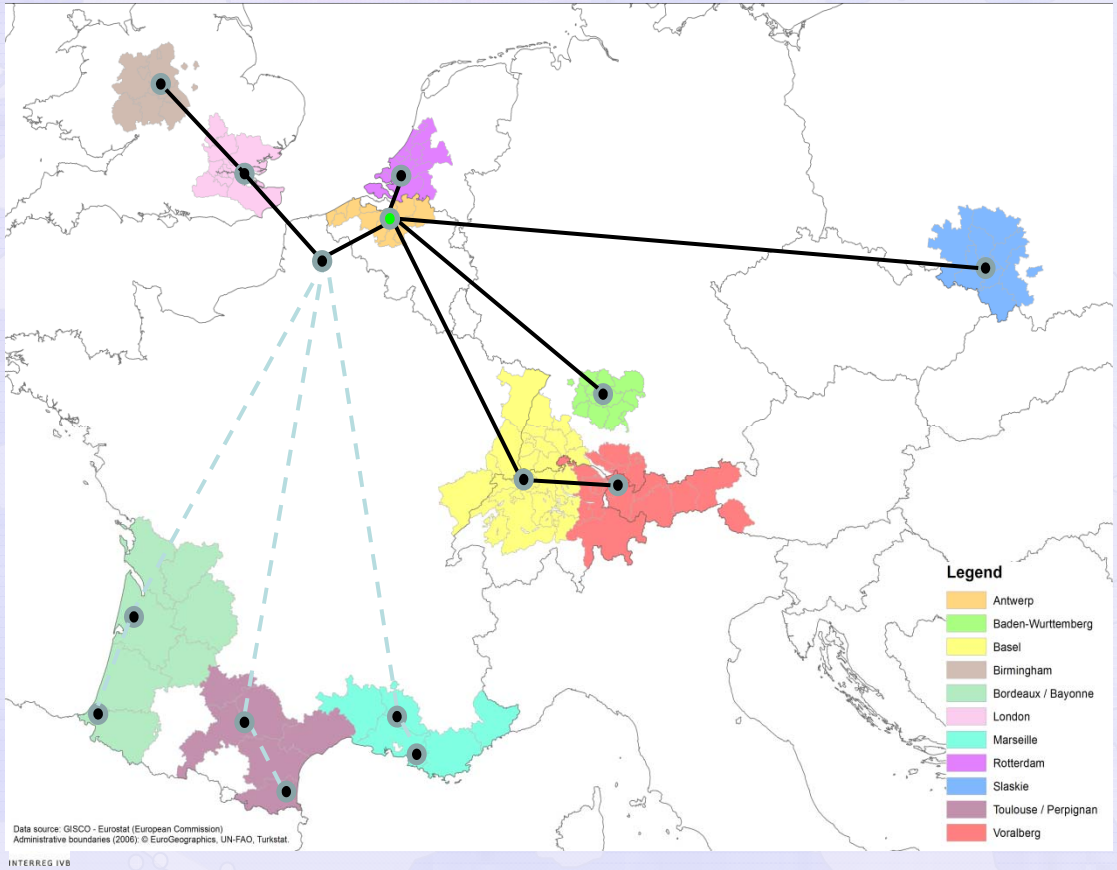
Potential locations hub terminal for Rotterdam flows



Twin hub concept, seamless 2a

- Each train and container only visits 1 hub per journey ?

  Seamless? YES and NO



Twin hub concept, seamless 4

- Cooperation between competitors
  - seaports
  - countries
  - intermodal rail operators

Seamless? YES and NO

No: not all seaports and countries willing to participate

YES: rail operators if they benefit from cooperation and are not blind by the idea od needing to go direct

Difficult: customer related issues are difficult cooperation subject.

Conclusions

Acknowledgement by practitioners of value added by concept

Many practical ideas make it tough work to implement concept

Questions ?