Contribution of infrastructure and interoperability on combined transport growth
Train path availability

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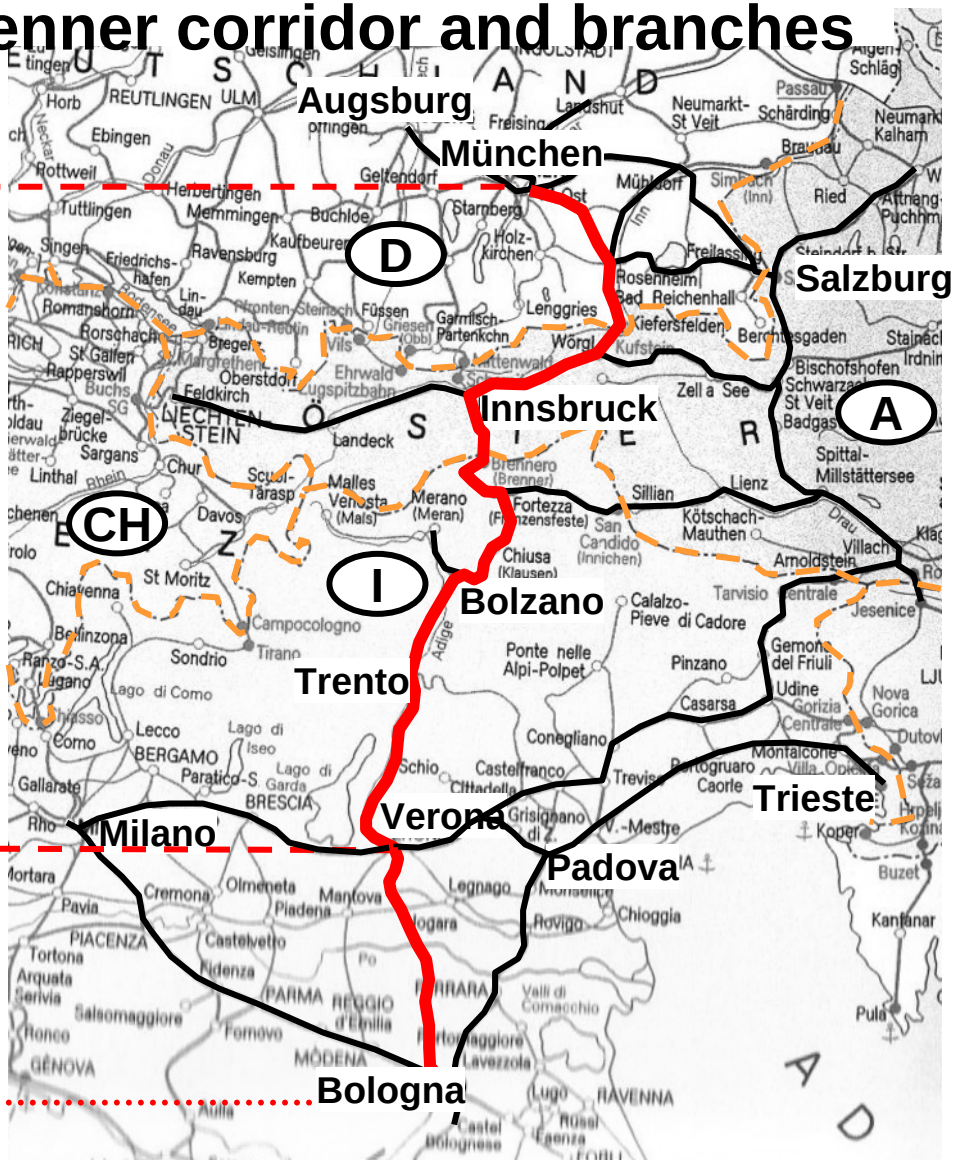
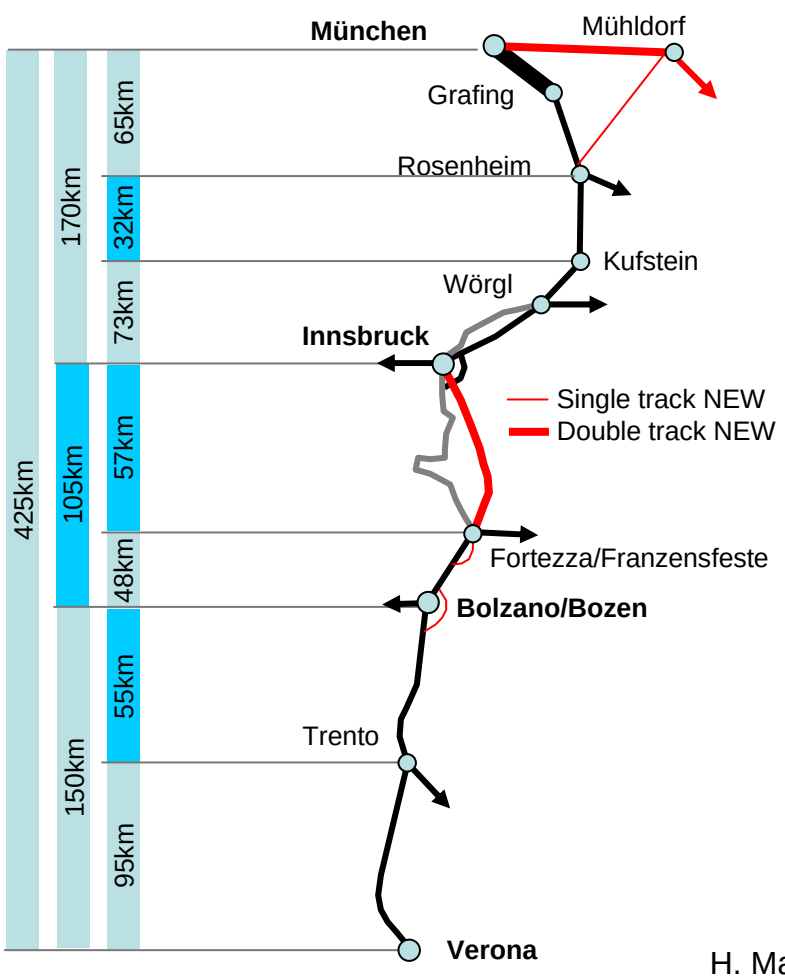
Main rail network in the Brenner corridor and branches

Core Section
Verona
-
München

Extension
Bologna
-
Verona



Infrastructure improvement Brenner Base Tunnel (EN)



- **„Horizon 2010“:**
  - actual line incl. capacity improvements (automatic block Brennero-Verona, 2006)
  - removal of bottle neck Unterinntal (4-track expansion Kundl-Baumkirchen, 2010)

  -> 18 Mio. t Capacity
- **„Planning case 2015“:**
  - 2-track Brenner-Basetunnel, 2016
  - Partly expansion of branch lines
    1-track Fortezza-Waidbruck,
    1-track by-pass Bolzano
  - partly expansion of expansion line München-Mühldorf-Freilassing
  - freight train relieve Mühldorf-Rosenheim

  -> 60 Mio. t Capacity
- **Additionally, simultanous necessesary:**
  - Rosenheim-Wörgl
  - Bolzano-Trento

H. Maak, Schrittweiser Ausbau der Brenner-Eisenbahnachse, ETR 7/8 2004

RoLa Services
New situation 2007
Ökombi

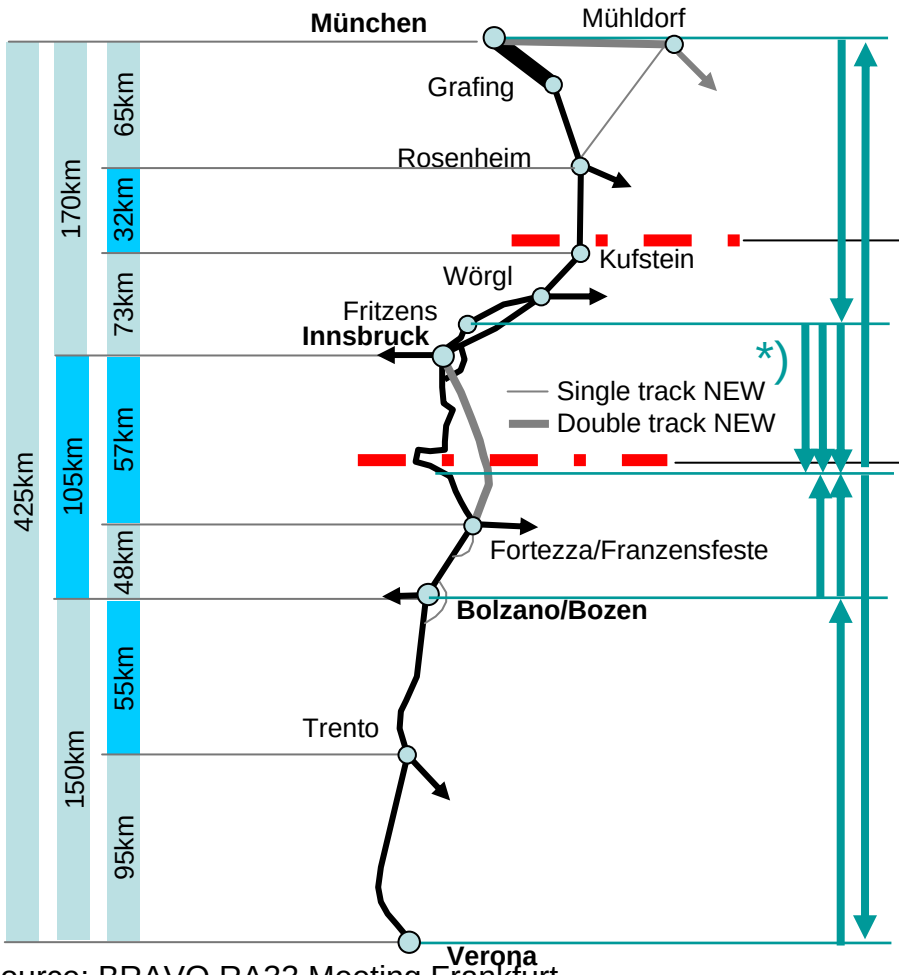
Relation	Trains both directions
Wörgl - Trento	56
Wörgl - Brennersee	170
+ from May 2007 Regensburg Trento	
Trains/week	228

Unaccompanied intermodal services 2006/07

Operator	Regular Trains per week both directions
Kombiverkehr / Cemat	186
TI / TX Company Trains	18
KombiDan / Cemat	12
Hupac (since 2007)	12
Trains/week	228

Infrastructure and System Framework

„Natural Breakpoints“: München and Verona for BRC-railways



✓ Language
✓ No Driver Change
✓ Brake Sheet
✓ Wagon List
○ Signalling System

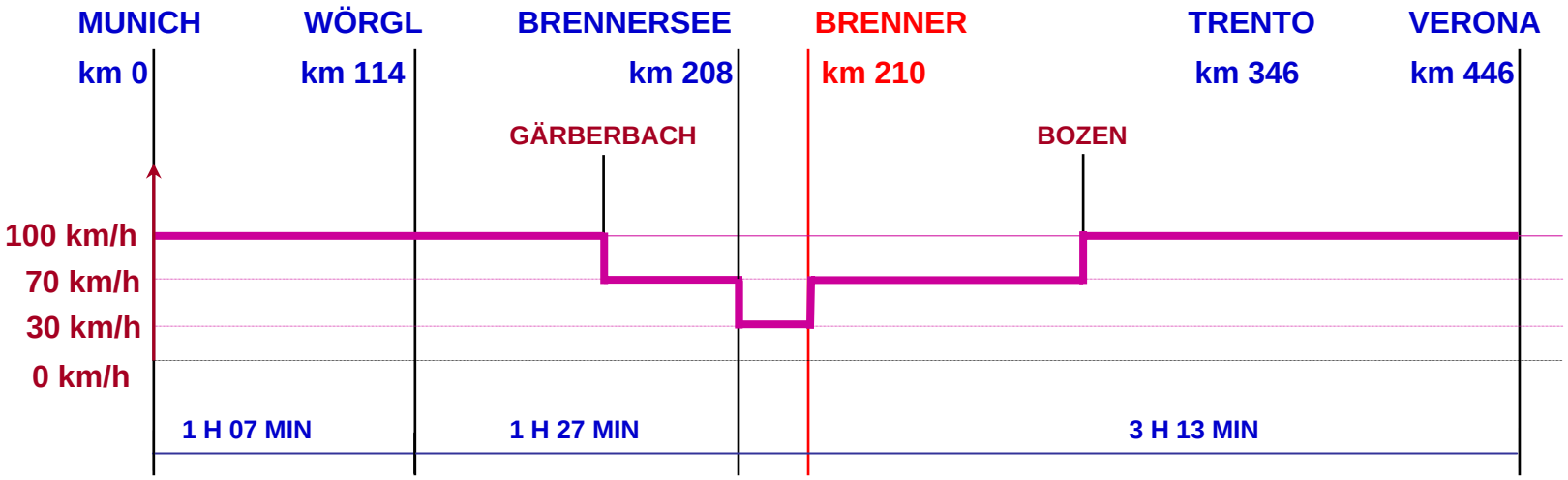
*) 2. > 600to
3. >1200to

1200to/550m
1300to/450m

○ Language
○ Change Driver
○ Driver 1+1
○ Brake Sheet
○ Wagon List
○ Signalling System
○ Train-Tail Plate/Lamp
○ Freight Note/Data Entry
○ Signalling System

Source: BRAVO RA33 Meeting Frankfurt

Velocity Profile (München – Verona)

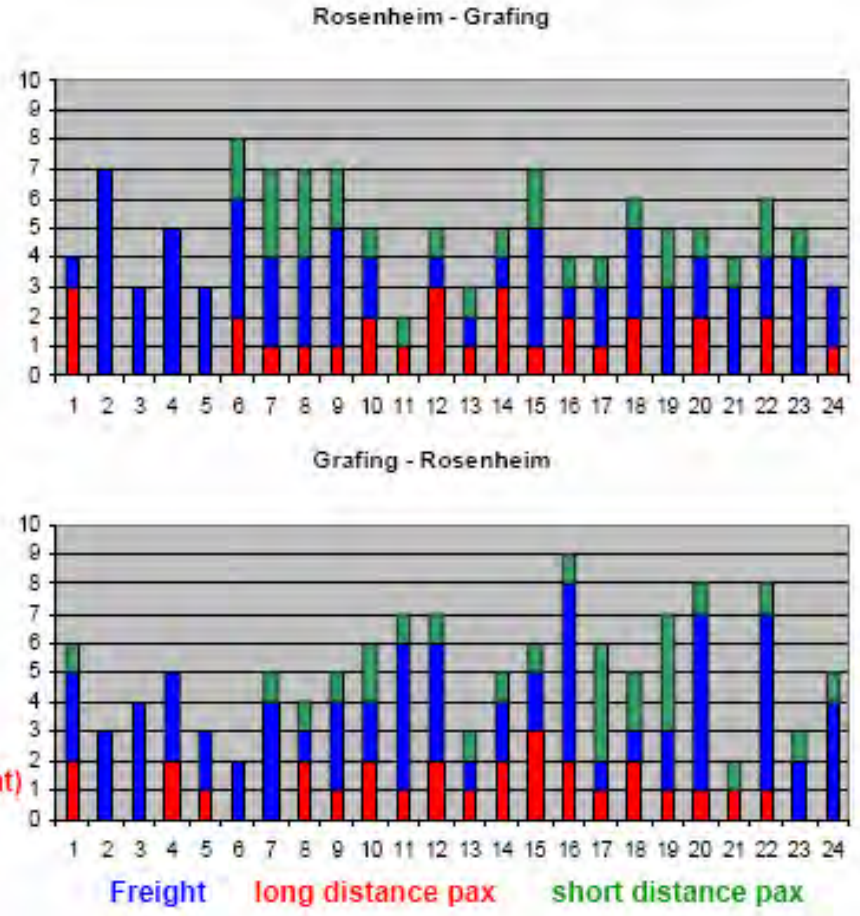


Source: ÖBB - Project Brenner Rail Cargo

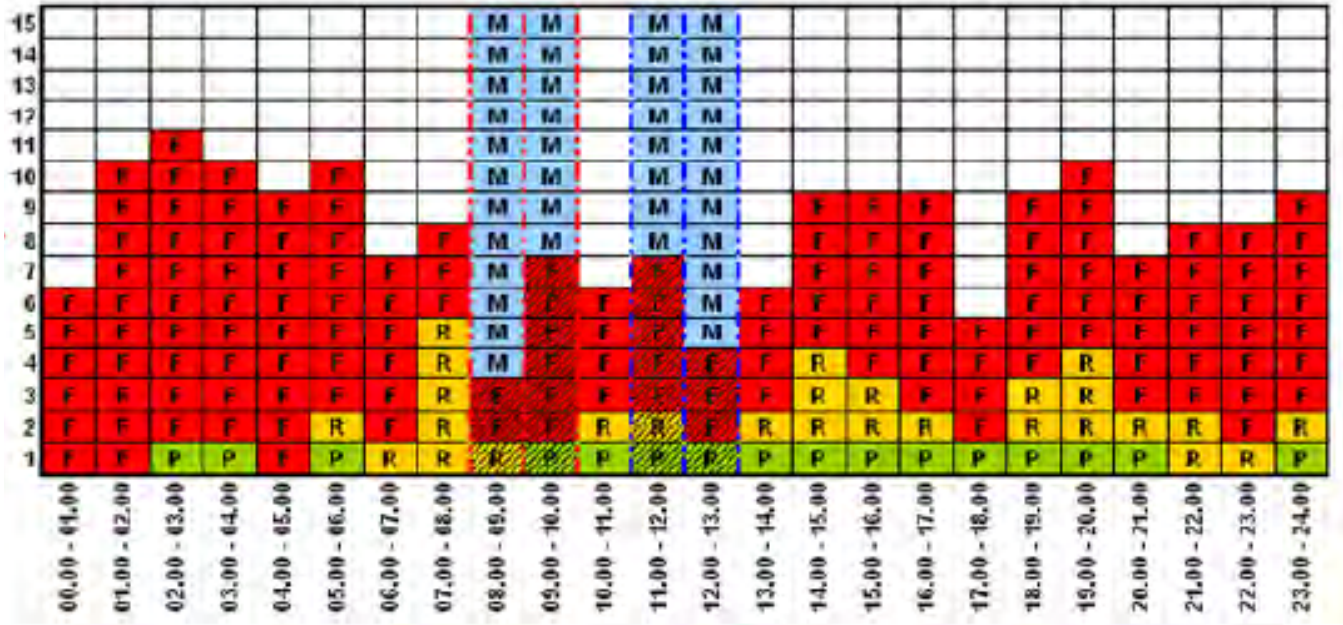
Highly used capacity: e.g. München – Rosenheim

TT 06 Thursday

"Mixed" structure of traffic (regional/long distance passenger, freight)



Use of Brennero/Brenner station during 24 hours



Current Bottlenecks – Line infrastructure

Apart from general saturation:

- **Decreasing possibilities of parking trains in the infrastructure of DB Netz (hampering buffering of trains in case of operational irregularities):**
  - **Intensification of bottlenecks at departure and arrival stations by back-tailing of trains in the network or already at the departure terminals**
- **Availability of reserve and evasion slots in case of operational irregularities:**
  - **Avoiding of train stops at transfer stations because of loss of connecting slot (train path)**
- **Nodal point of München and operations on München – Grafing – Rosenheim**

Bottlenecks at stations / nodes

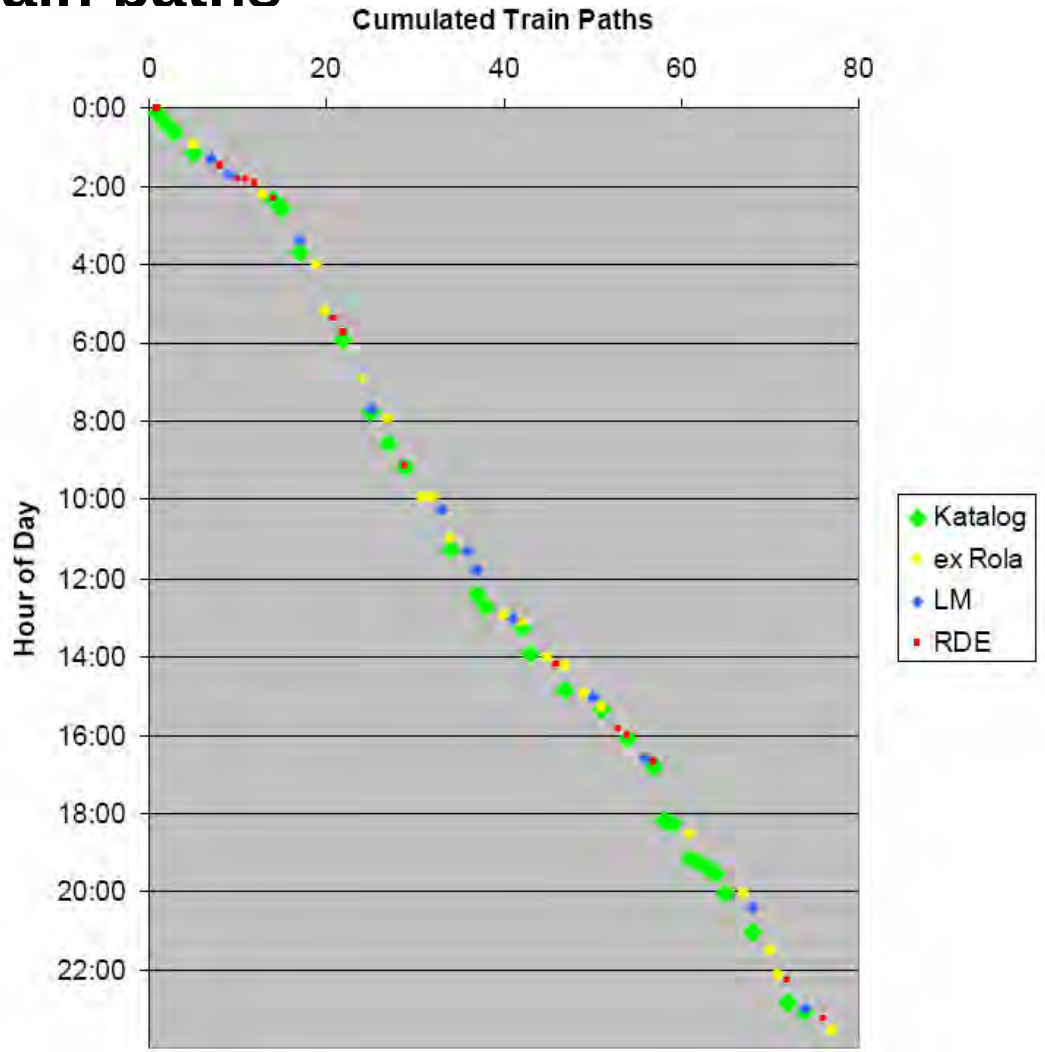
- Brenner station (Change of System)
  - Complex (time consuming and costly) operation concept for locomotive change because of rigid separation of systems (no reversible tracks or routes)
  - potential capacity bottleneck hampering increase of freight trains in relation with current operation concept and regulations of RFI
- Bolzano station
  - Occupied by passenger trains
  - Manual switches and signalling/train control does not allow to use as locomotive changing station
  - Capacity bottleneck to optimise locomotive cycle times

Conclusions

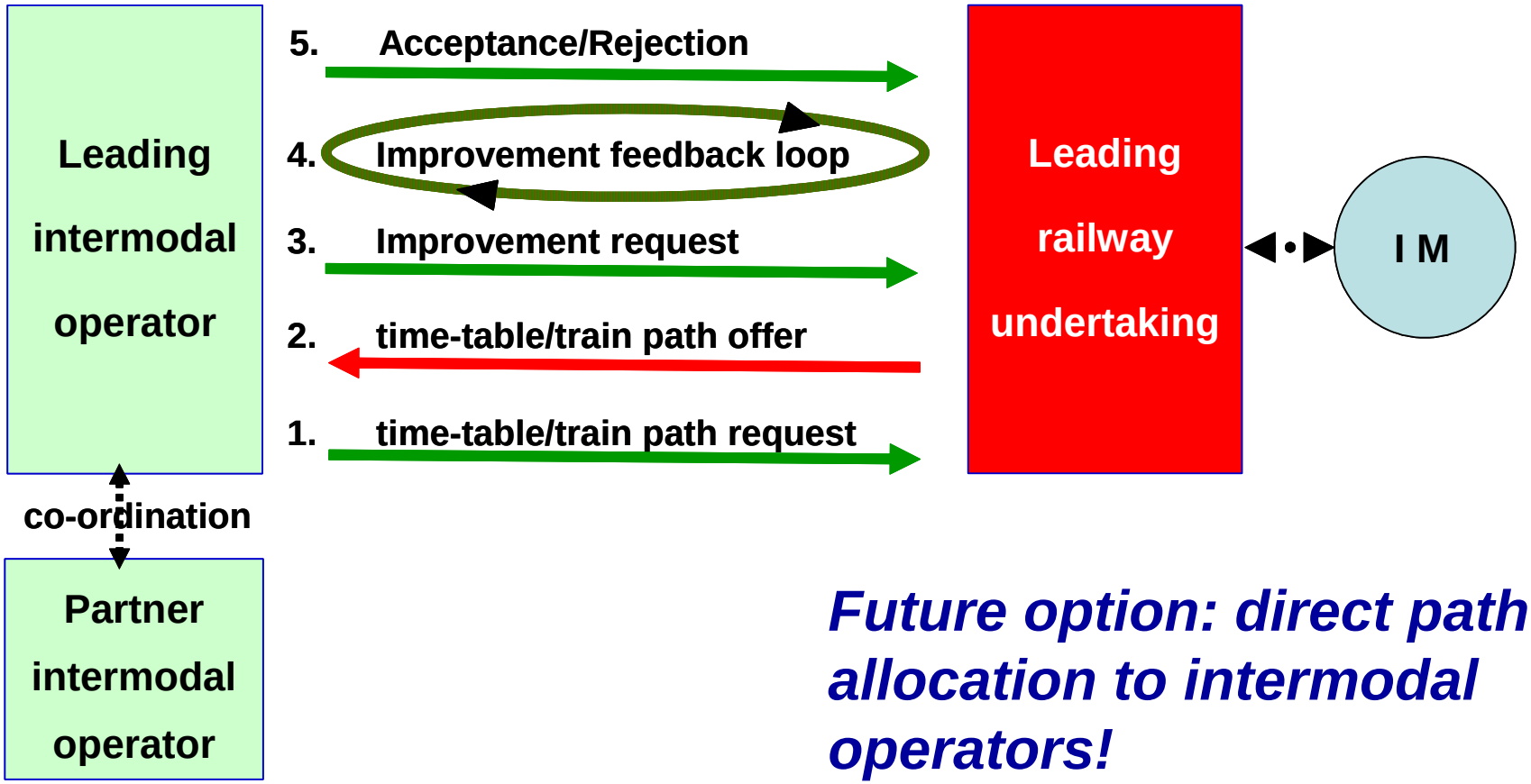
- Current overall capacity is satisfying, whereas bottlenecks have been identified
- Further Operational Analysis can just be carried out by Infra Managers using timetable/simulation-tools
- “Round Table” between IMs and customers useful to agree upon priority measures
- Infrastructure Investments needed:
  - München-Augsburg (two additional tracks Augsburg-Olching) (ongoing)
  - Truderinger Kurve (for direct access to München-Riem Ubf)
  - Kufstein-Innsbruck (two additional tracks between Kundl-Baumkirchen) for segregation of fast and slow traffic (ongoing)

Analysis of catalogue train paths

- 30 catalogue train paths
- 24 additionally available in each direction
- average time Munich Verona 7:30 h
- no difference to scheduled trains

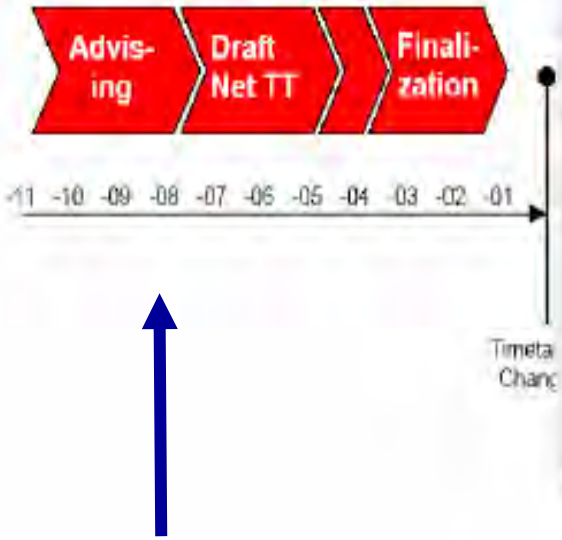


The role of the intermodal operators in train path scheduling



Future option: direct path allocation to intermodal operators!

Current process and proposed process



- Regular time table processes
  - X-13: discussion between RU
  - X-11 to x-8: IM and RU - studies
  - X-8 ordering — X-5 ordering
  - X-8 to x-6: construction
  - X-6 to x-5: fine tuning — X-3 acceptance
  - X-5: allocation
  - X-5 to x+12: allocation in free capacity — X change of timeta-ble
- Ad-hoc requests during the year

8 months but if a customer comes after the deadline it can be up to 20!

Short term: within 5 days if slots are available!