

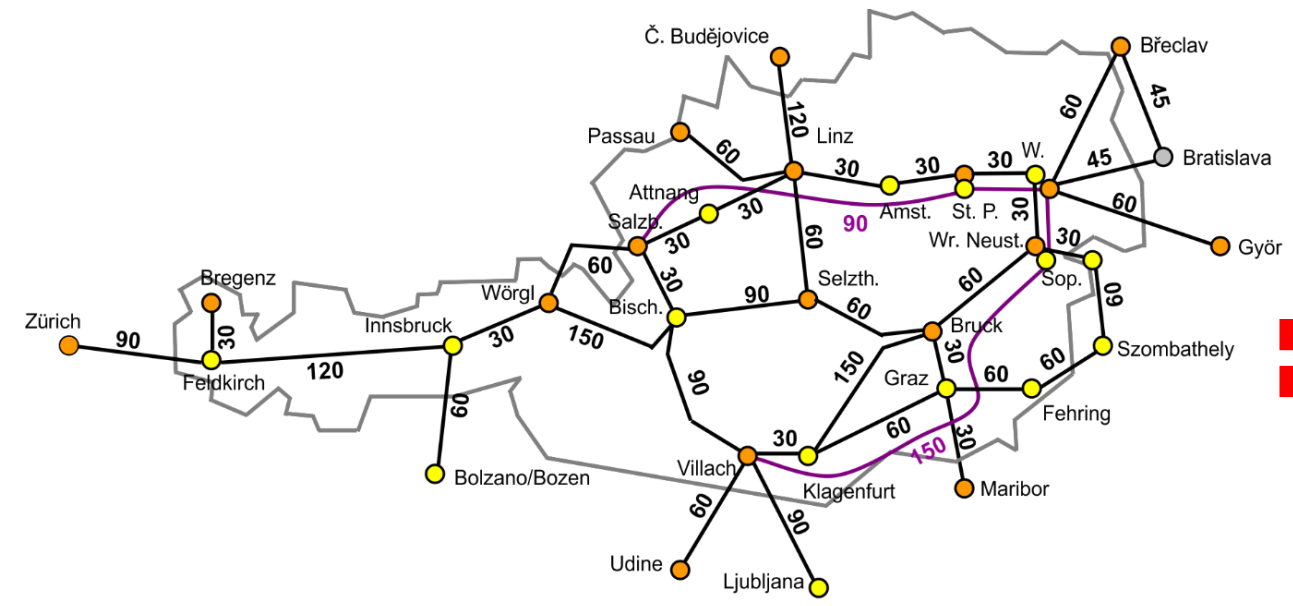
System train paths as the key to efficient infrastructure usage for on-track competition in ITF-regimes

Martin Smoliner
Graz University of Technology

*Introducing On-track Competition in Passenger Rail Services 2019
14.03.2019, Masaryk University Brno*



On-Track Competition

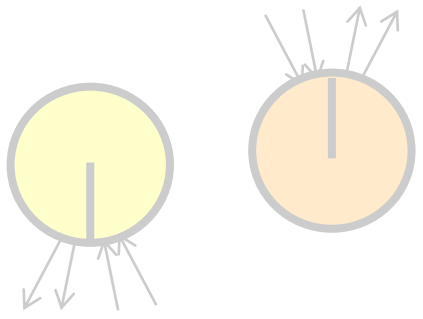


Integrated Periodic Timetable (ITF) / Long Term Infrastructure Development

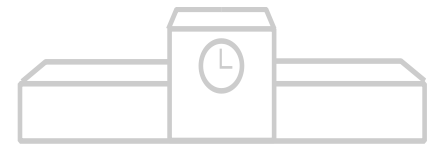
Challenge for Infrastructure Managers

➤ **systematic approach required**

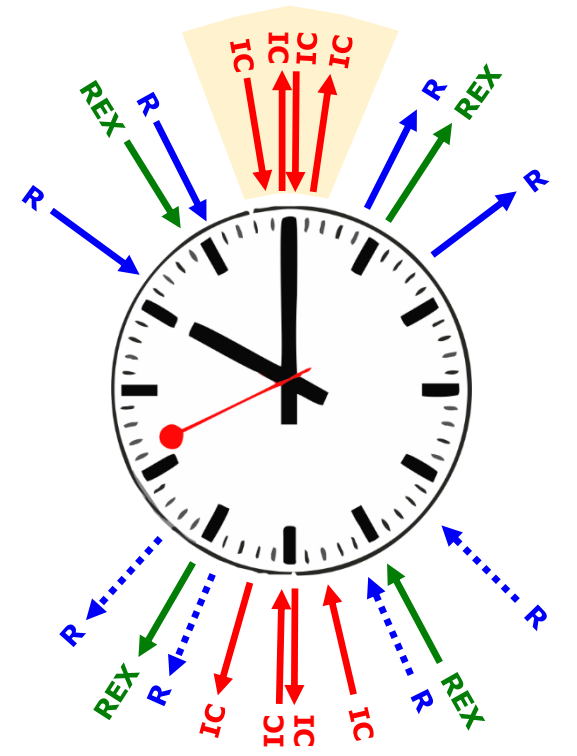
theory



hub Amstetten

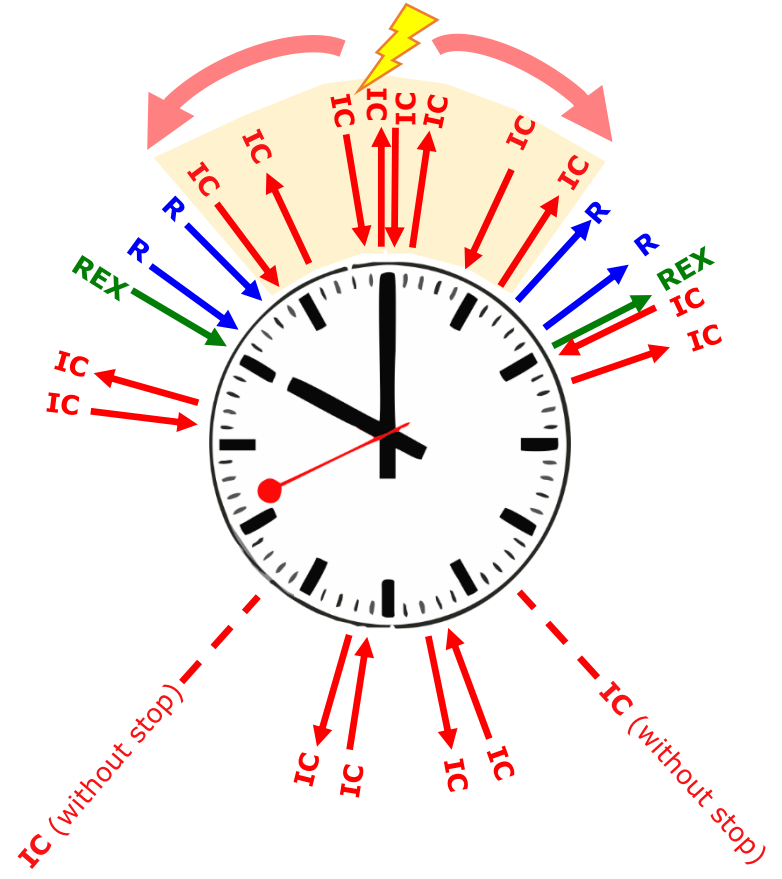


concept 2009

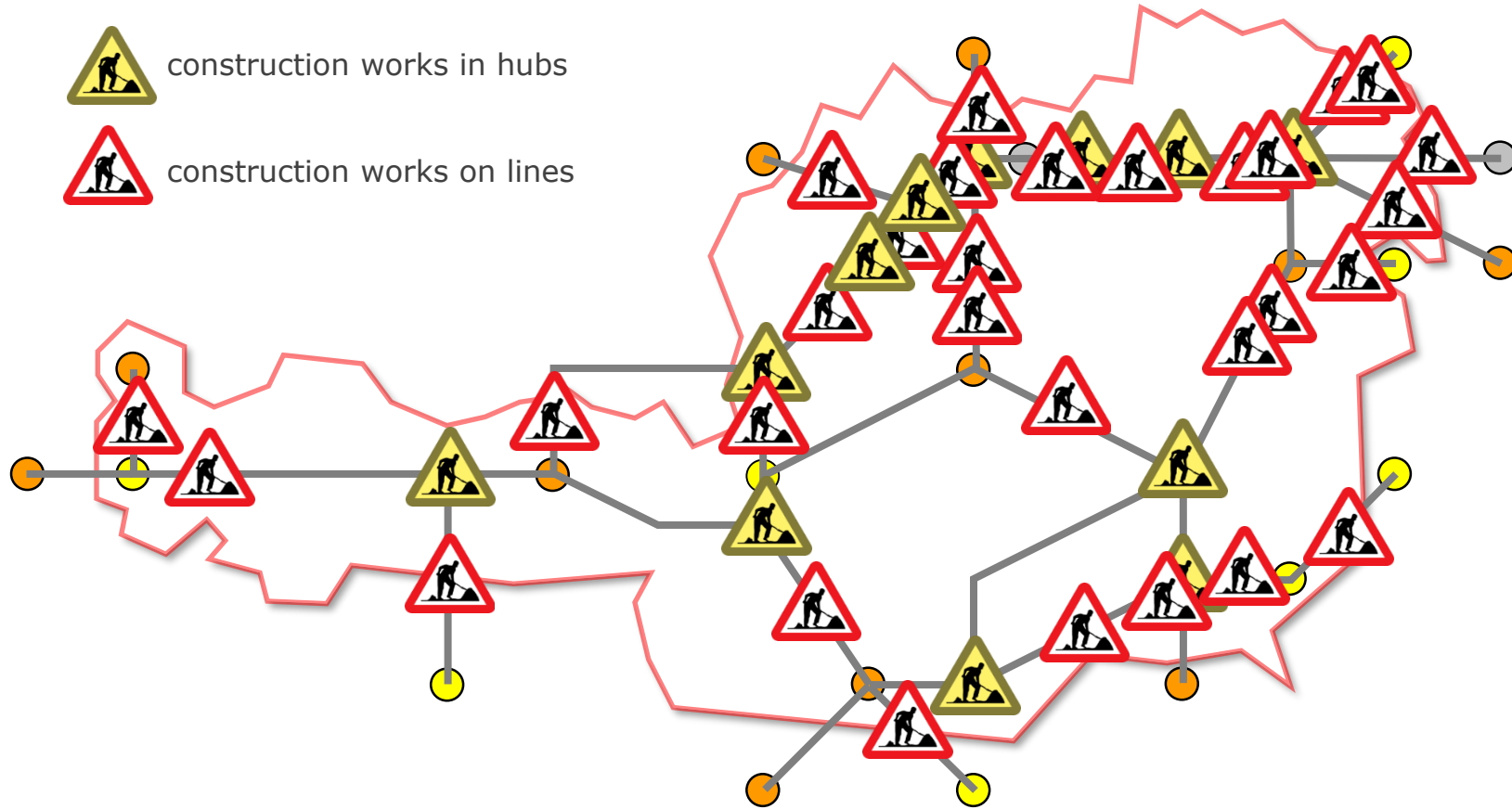


- IC (Intercity, Express Train)
- REX (Regional Express Train)
- R (Regional Train)

situation 2018



➤ **hub spreading critical**



**overall infrastructure investments
in the Austrian railway network 1990-2040** **100%**

Relevant investments for ITF:



Approach 1 **51%**

according to target timetable 2025+
(rough first estimate)

Approach 3 **31%**

considering only ITF-effective measures and
relevant proportion of hub-investments
- investments due to capacity reasons

Today...

...the entire network is offered, customers ask for train paths designed due to their specific demand.

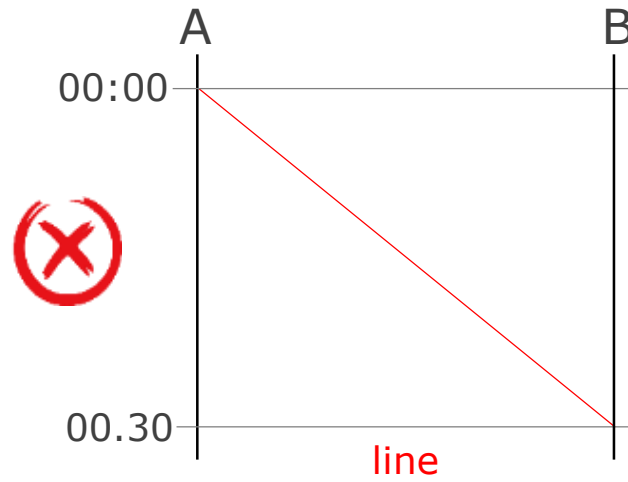
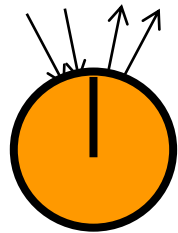
Problem...

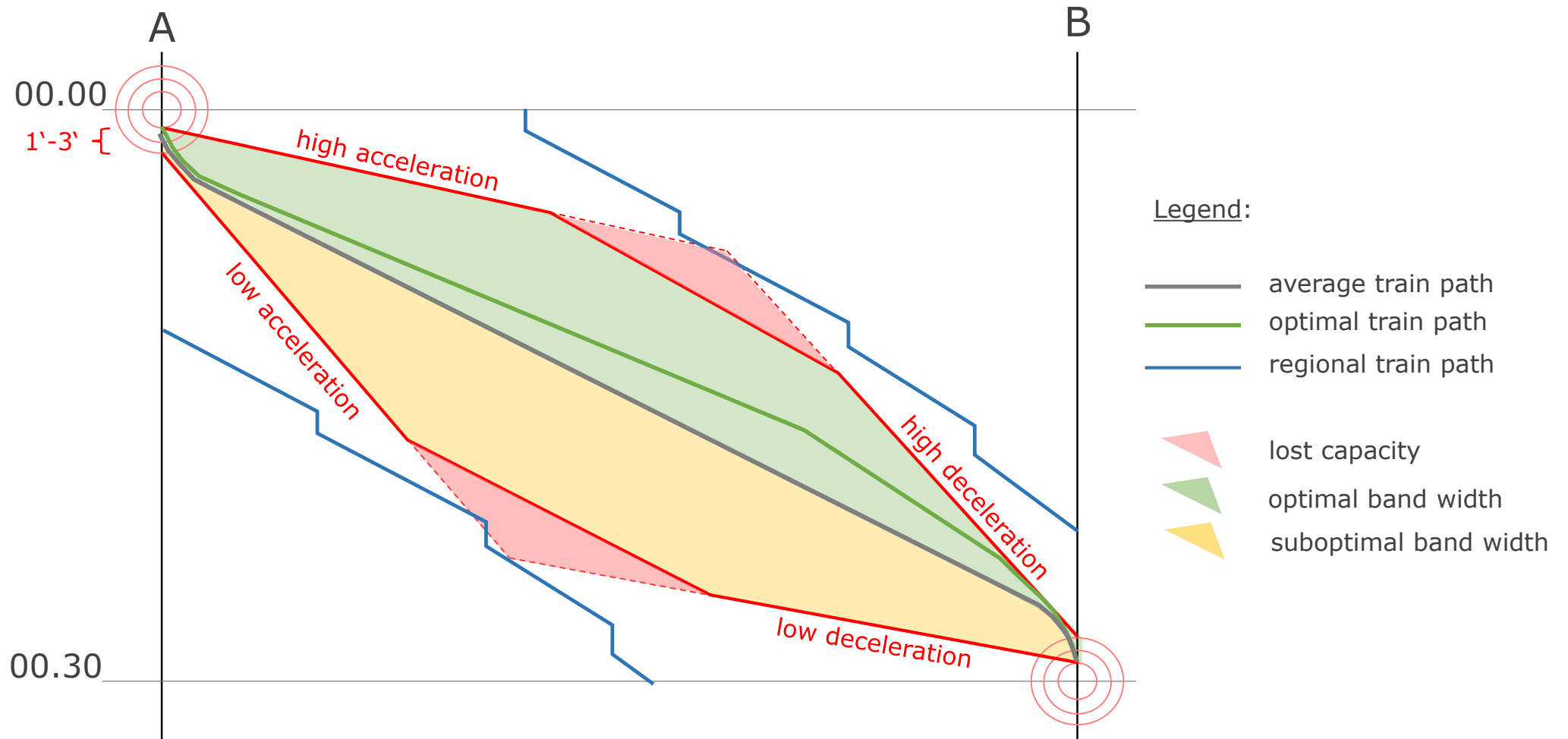
...in case of train paths conflicts the Integrated Timetable (ITF) cannot be ensured.

Solution...

...system train paths are offered. Part of the network is offered as today, however, a conflict with system train paths is not acceptable.

➤ ***appropriate scheme*** → ***system train path (STP)***





➤ ***STP: deltoid shape → enables flexibility***

Amstetten

St. Pölten

Vienna



Amstetten – St. Pölten

Infrastructure

distance: 63,5 km
 edge target time: 30 min
 hub in-between: none
 maximum line speed: 200-230 km/h

Riding times

EMU 1	21,4 min
EMU 2	21,4 min
train set	21,7 min

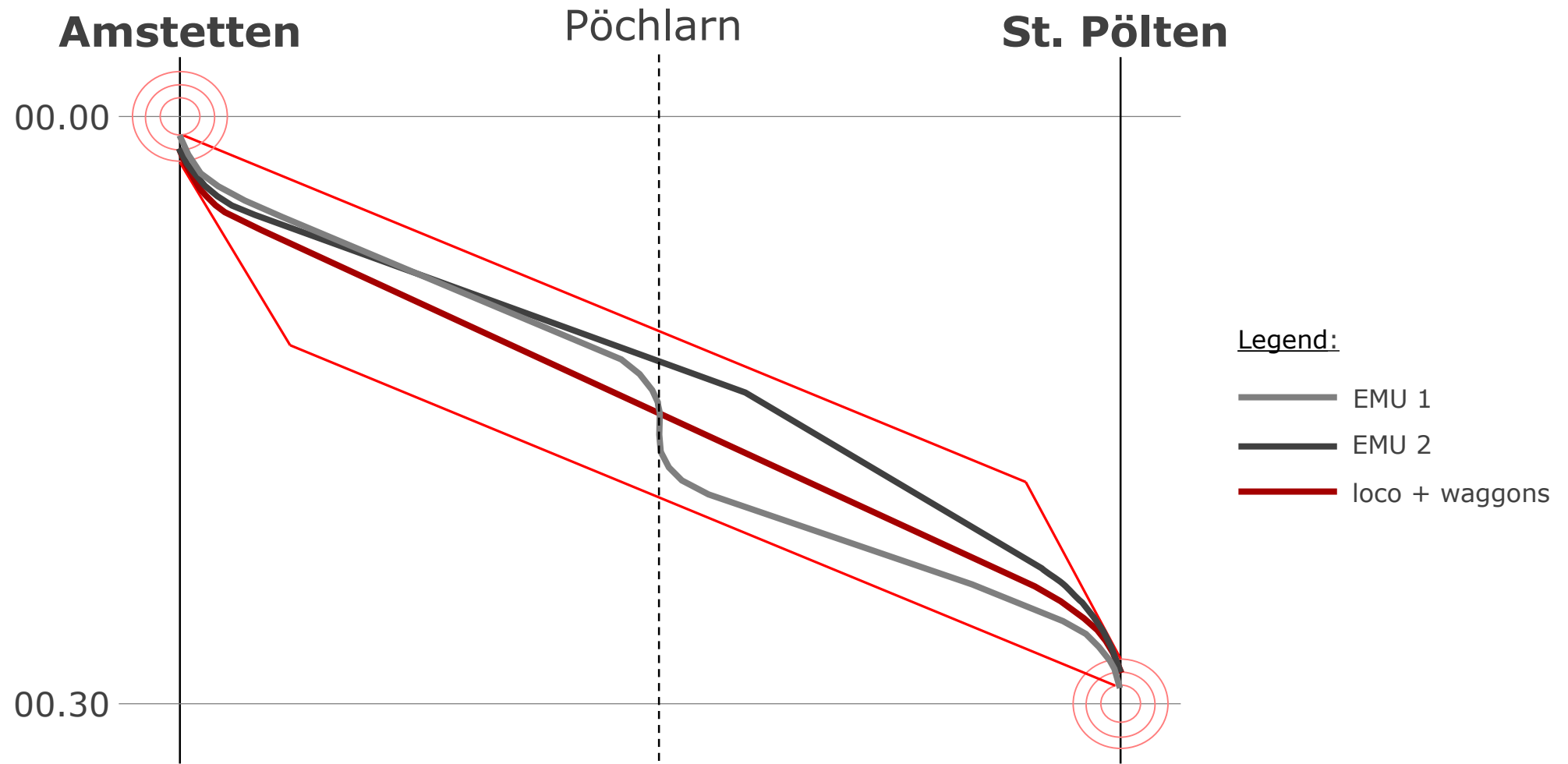
St. Pölten – Vienna

Infrastructure

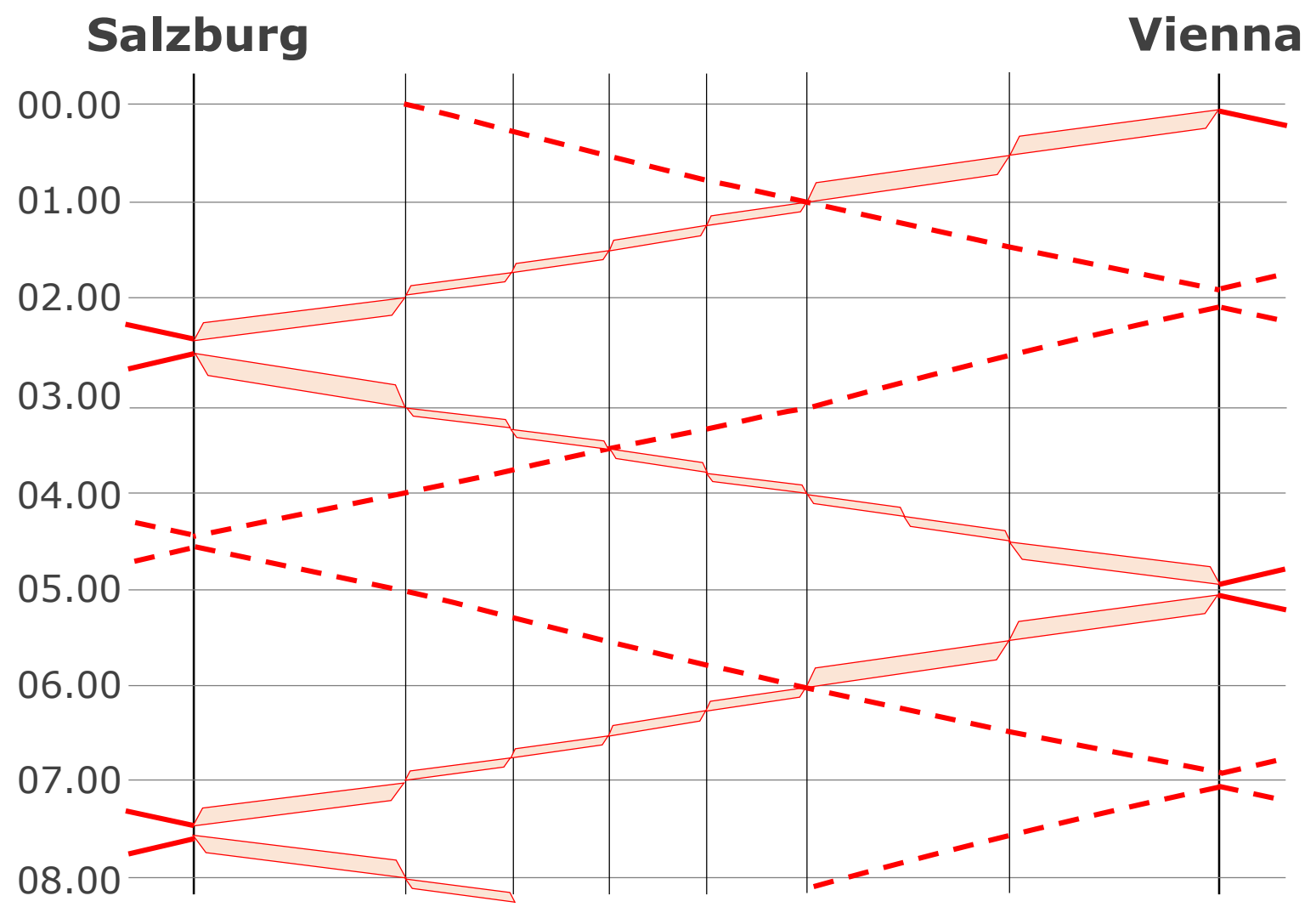
distance: 60,6 km
 edge target time: 30 min
 hub in-between: Meidling Bf.
 maximum line speed: 80-250 km/h

Riding times

EMU 1	24,0 min
EMU 2	25,6 min
train set	24,3 min



➤ ***STP: parameters influence shape of deltoid***



Conclusion

System train paths...

...are a scheme to offer the railway undertakings attractive train paths according to the rules of the ITF.

This scheme guarantees...

- ...an optimal network-wide implementation of the ITF.
- ...compliance with the framework of the EU-legislation.
- ...the highest possible customer benefit.

WESTbahn Tickets

OBB

LIEBLINGSPLATZ
UM NUR 1€

OBB 1€

westbahn

we bahn a

€15,90

REGIOJET

WIIEN-BRÜNN-PRAG

WIIEN-PRAG

um 15€

REGIOJET

WIIEN-BRÜNN-PRAG

PRAG 15 BRÜNN 15

Looking forward to a lively discussion!

WESTbahn Tickets

OBB

LIEBLINGSPLATZ
UM NUR 1€
RESERVIERUNG

OBB 1€ RESERVIERUNG

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we bahn a

€15,90

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REGIOJET

WIIEN - BRÜNN - PRAG

WIIEN-PRAG

UM 15€

RESERVIERUNG UND INFORMATION AUF WWW.REGIOJET.AT

REGIOJET

WIIEN - BRÜNN - PRAG

PRAG	15	BRÜNN	7
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Backup

parameters	timetable	infrastructure	vehicle
hub	<ul style="list-style-type: none"> minimal stopping time transfer time 	<ul style="list-style-type: none"> track layout speed limit of tracks and turnouts 	<ul style="list-style-type: none"> time of passenger boarding door size opening speed of doors low floor vehicle
edge	<ul style="list-style-type: none"> stops in-between time reserves / timetable stability capacity 	<ul style="list-style-type: none"> distance maximum line speed unplanned track changes 	<ul style="list-style-type: none"> maximum speed acceleration mass vehicle length energy saving

Conclusion

New Mobility - High-Speed Transport Systems and Transport-Related Human Behaviour
CZ.02.1.01/0.0/0.0/16_026/0008430



EUROPEAN UNION
European Structural and Investment Funds
Operational Programme Research,
Development and Education



- 1.) systematic approach required***
- 2.) hub spreading critical***
- 3.) appropriate scheme → system train path (STP)***
- 4.) STP: deltoid shape → enables flexibility***
- 5.) STP: parameters influence shape of deltoid***

