

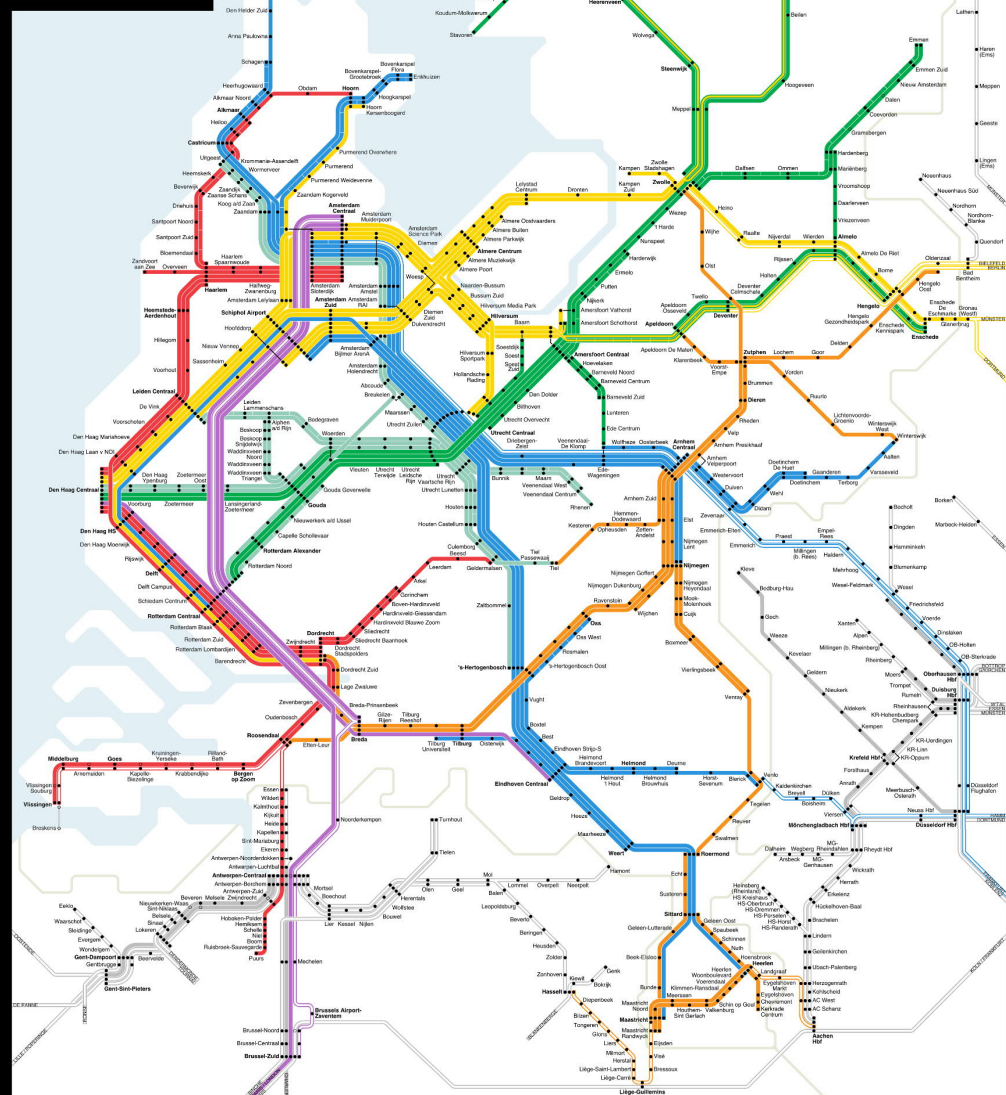
Welkom

Redesigning the Dutch Railways

Klaas Hofstra
Head of infrastructure and timetable design at ProRail

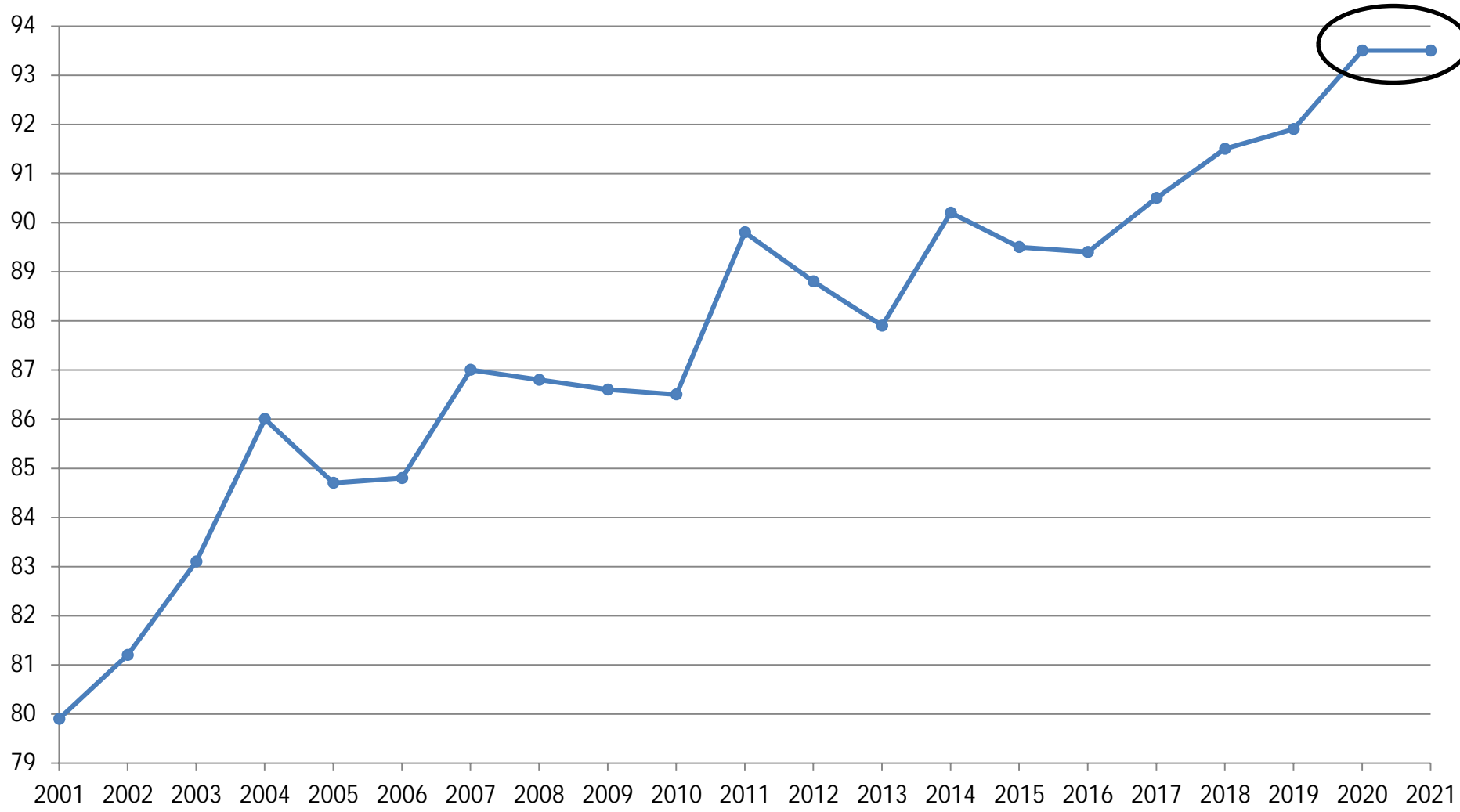
Forum OV Planung
September 2022

Legend for the railway map showing symbols for train types (high speed, regional, etc.), stations, and infrastructure like bridges and viaducts.



Train Punctuality Netherlands (measured at 2'59")

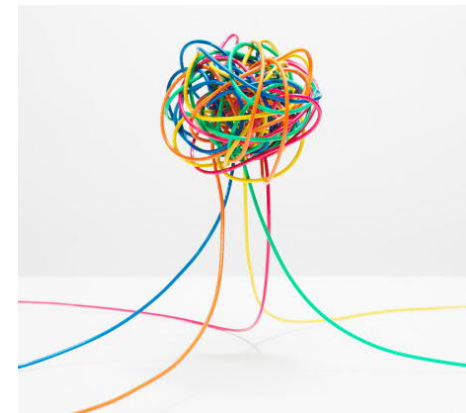
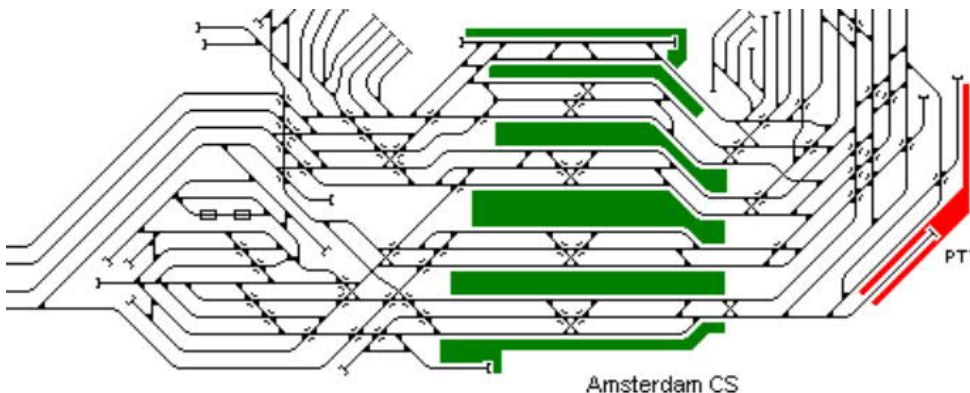
COVID



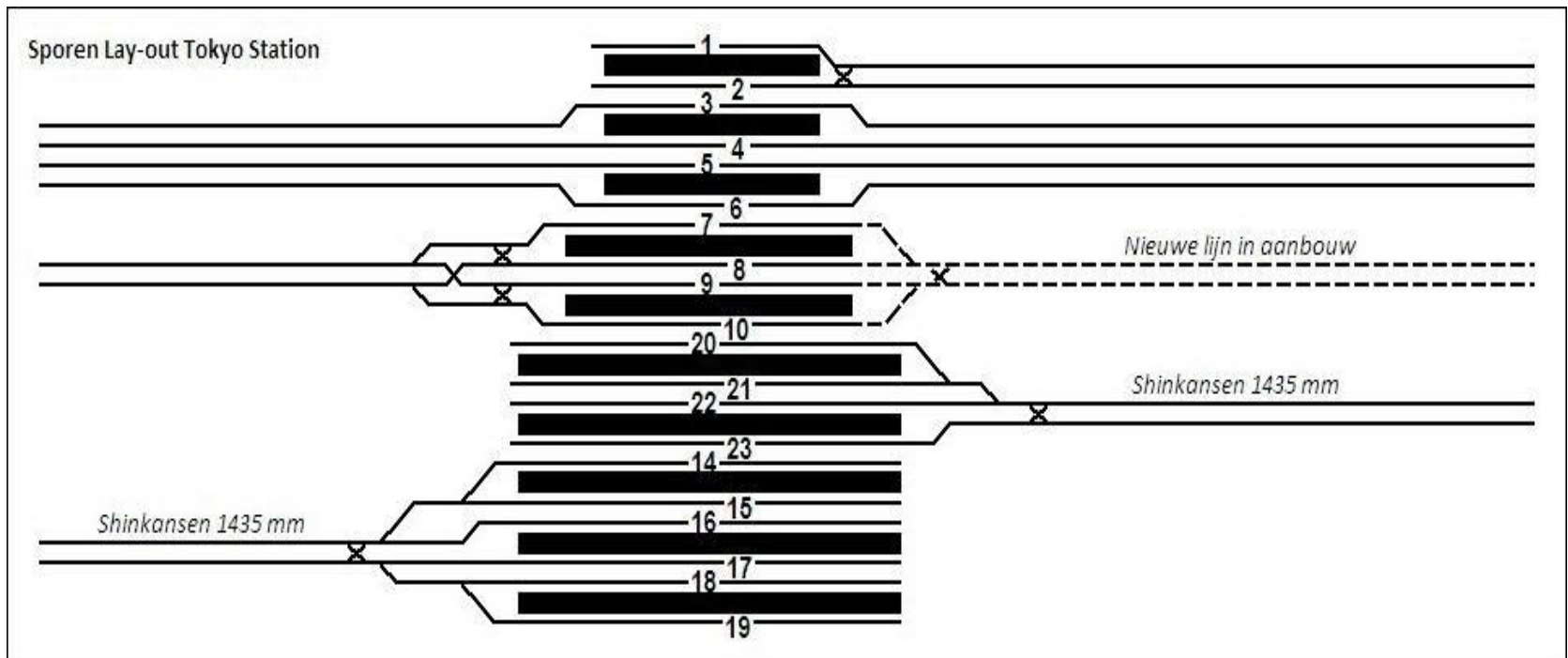
Why do we redesign the infrastructure?

Our railway network has grown organically over the decades. The basic layout has not changed much since the steam era. The only thing we did is adding tracks here and platforms there, leading to a patchwork with a lot of “tape and paperclips”.

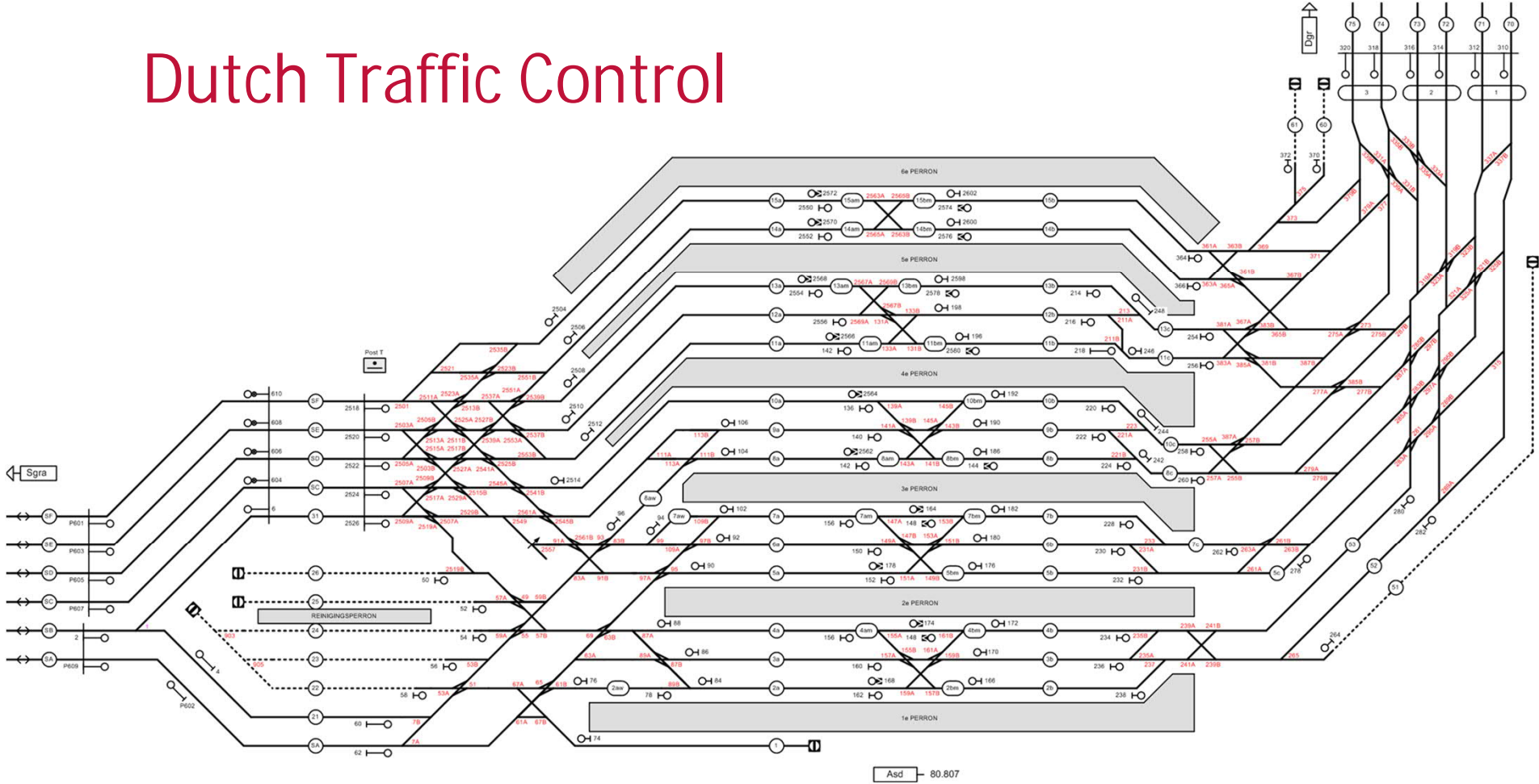
The so-called “flexibility” that we got as a result is the worst enemy of a high-performance railway system. An infrastructure with many options is not fit for purpose, it is prone to disruptions and expensive to maintain.



Japanese Traffic Control



Dutch Traffic Control



The lessons from Japan

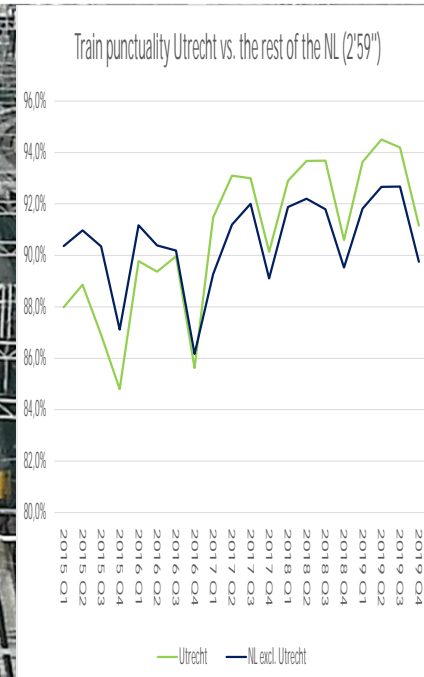
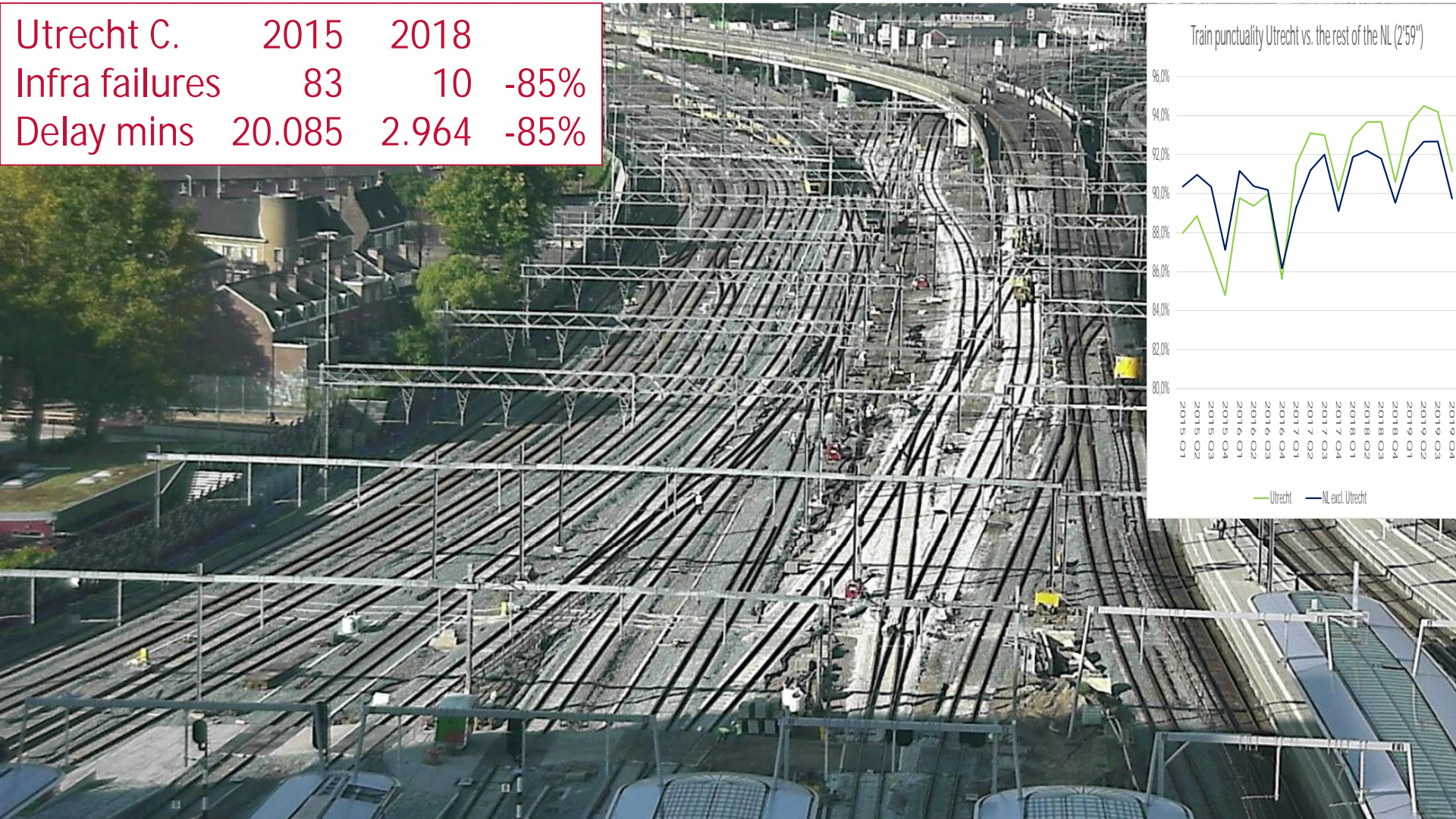
- I. We should invest every available Euro
in reducing our operational costs

- II. We cannot expect our operational staff
to solve the problems we created
Instead we should enable them to do their job

How do we do that?
With a full redesign of our railway!

In service since december 2016

Utrecht C.	2015	2018	
Infra failures	83	10	-85%
Delay mins	20.085	2.964	-85%



Main focus: capacity, capacity, capacity

The new layout of Utrecht Centraal delivers a doubling in capacity, allowing for all foreseeable growth in the next 30 years.

Number of hourly depts.	Track	2016	2022	2030	Max	Remarks
NE Local	1-4	8	8	10	12	
NW-SE IC	5/7, 18/19	16	24	32	48	
NE-SW IC	8-12	12	14	16	16	
NW-E Local	14/15	8	8	8	8	+Cargo
W-S Local	20/21	8	12	16	24	
Total		52	66	82	108	

“From Utrecht to the whole country” Main themes for network optimisation

Operational cost	Operational performance	Capacity / Frequency	Sustainability	Safety
Reduce the amount of assets, mainly switches	Reduce the amount of possible routes and “derusting”	Shorter blocks, higher speeds	Reduce and reuse materials and assets	Simplify the track layout
Reduce switch-heating	Reduce disruptions and possessions for maintenance	ETCS, but only on decent infrastructure	Reduce switch-heating	Remove and improve level crossings
Phase out non-standard assets	Enough margin in the timetable: always, everywhere	Longer/wider platforms, 740m	Remove local speed restrictions	Phase out non-compliant signalling
Reduce slack in the timetable	Give train drivers more precise information	Match timetable and infrastructure	Timetable for energy efficiency	Enough margin in the timetable

Gebied ZUIDWEST INFRA tot 2030

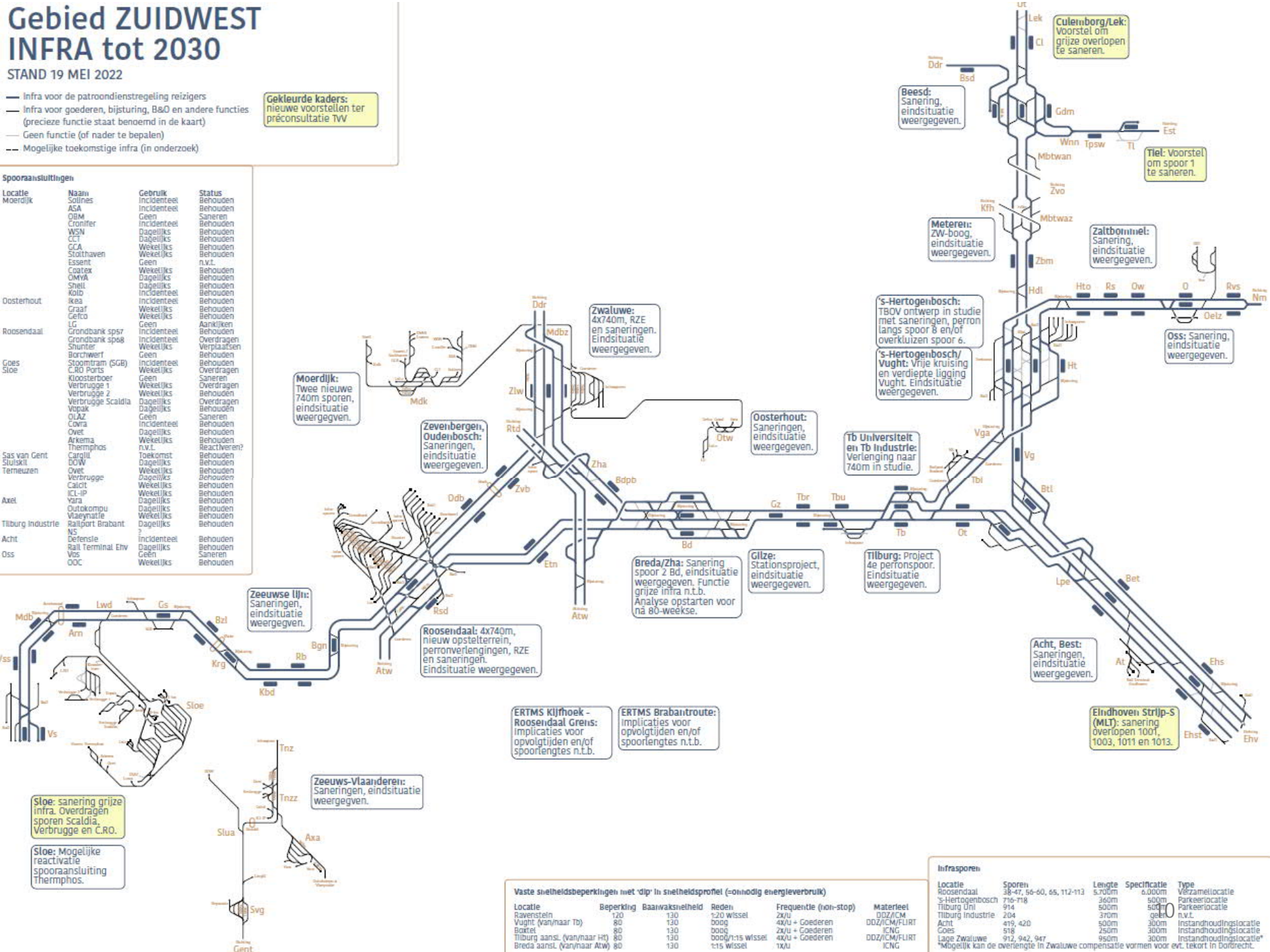
STAND 19 MEI 2022

- Infra voor de patroondienstregeling reizigers
- Infra voor goederen, bijsturing, B&O en andere functies (precieze functie staat benoemd in de kaart)
- Geen functie (of nader te bepalen)
- Mogelijke toekomstige infra (in onderzoek)

Gekleurde kaders:
nieuwe voorstellen ter
preconsultatie TVV

Spooraansluitingen

Locatie	Naam	Gebruik	Status
Moerdijk	Solinas	Incidenteel	Behouden
	ASA	Incidenteel	Behouden
	OBM	Geen	Saneren
	Cromfler	Incidenteel	Behouden
	WEN	Dagelijks	Behouden
	CCT	Dagelijks	Behouden
	GCA	Wekelijks	Behouden
	Stadhaven	Wekelijks	Behouden
	Essent	Geen	n.v.t.
	Coatex	Wekelijks	Behouden
	OMVA	Dagelijks	Behouden
	Shell	Dagelijks	Behouden
	Kob	Incidenteel	Behouden
Oosterhout	Ikea	Incidenteel	Behouden
	Craaf	Wekelijks	Behouden
	Cefco	Wekelijks	Behouden
	LG	Geen	Aankijken
Roosendaal	Grondbank sp57	Incidenteel	Behouden
	Grondbank sp08	Incidenteel	Overdragen
	Shunter	Wekelijks	Verplaatsen
	Borchwerf	Geen	Saneren
	Stoomtram (SGB)	Incidenteel	Behouden
	C.R.O. Ports	Wekelijks	Behouden
	Kloosterboer	Geen	Saneren
	Verbrugge 1	Wekelijks	Overdragen
	Verbrugge 2	Wekelijks	Behouden
	Verbrugge Scaldia	Dagelijks	Behouden
	Vopak	Dagelijks	Behouden
	OLAZ	Geen	Saneren
	Covra	Incidenteel	Behouden
	Ovet	Dagelijks	Behouden
	Arkema	Wekelijks	Behouden
	Thermphos	n.v.t.	Reactiveren?
Sas van Gent	Caroil	Toekomst	Behouden
Sluiskil	DOV	Dagelijks	Behouden
Terneuzen	Ovet	Wekelijks	Behouden
	Verbrugge	Wekelijks	Behouden
	Calci	Wekelijks	Behouden
	ICL-IP	Wekelijks	Behouden
	Yara	Dagelijks	Behouden
	Outokumpu	Dagelijks	Behouden
	Vlaamse	Wekelijks	Behouden
Axel	Railport Brabant	Dagelijks	Behouden
Tilburg Industrie	N2	Incidenteel	Behouden
Acht	Deense	Incidenteel	Behouden
Oss	Rail Terminal EHV	Dagelijks	Behouden
	VOS	Geen	Saneren
	OOO	Wekelijks	Behouden



Sloe: sanering griize infra. Overdragen sporen Scaldia, Verbrugge en C.R.O.

Sloe: Mogelijke reactivatie spooraansluiting Thermphos.

Vaste snelheidsbeperkingen met 'dip' in snelheidsprofiel (=onnodig energieverbruik)

Locatie	Beperking	Baanwaksnelheid	Reden	Frequentie (non-stop)	Materieel
Ravenstein	120	130	±20 wissel	2k/U	DDZ/CM
Vught (van/naar Tb)	80	130	000g	4k/U + Goederen	DDZ/CM/FLIRT
Baret	80	130	000g	2k/U + Goederen	ICNG
Tilburg aansl. (van/naar HT)	80	130	000g/1:15 wissel	4k/U + Goederen	DDZ/CM/FLIRT
Breda aansl. (van/naar Atw)	80	130	1:15 wissel	1k/U	ICNG

Infrasparen

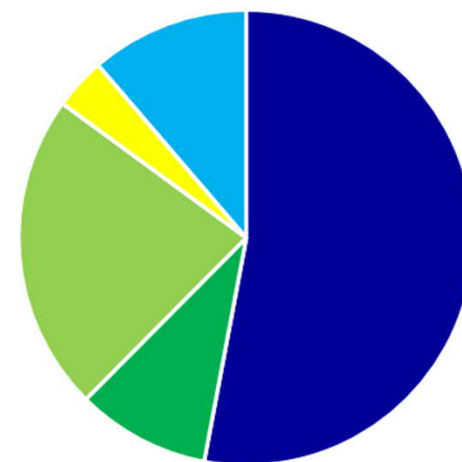
Locatie	Sporen	Lengte	Specificatie	Type
Roosendaal	38-47, 56-60, 65, 112-113	5.700m	6.000m	Verzamellocatie
's-Hertogenbosch	716-718	260m	500m	Parkerlocatie
Tilburg (U)	914	500m	500m	n.v.t.
Tilburg Industrie	204	370m	300m	geen
Acht	419, 420	500m	300m	Instandhoudingslocatie
Goes	918	150m	150m	Instandhoudingslocatie
Lage Zwaluwe	912, 942, 947	950m	300m	Instandhoudingslocatie*

*Mogelijk kan de overligende in Zwaluwe compensatie vormen voor evt. tekort in Dorbrecht

Number of switches (2018)	Mainline	Yards
Keep / renew	4110	3457
Still to be checked	0	1006 (Rtd port)
Potential removal	1933	1082
Removed	390	415
To be removed in the coming years	928	346
Removal currently being studied	151	191
Not urgent	464	130

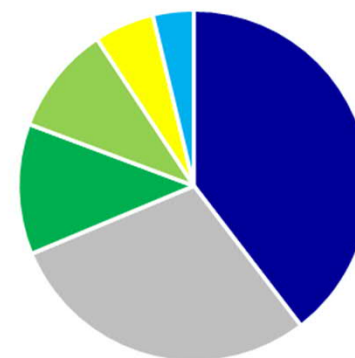
This table excludes around 500 new mainline switches being built in optimised track layouts.

Hoofdspoor



- Behouden
- In studie
- Is gesaneerd
- Geen urgentie
- Wordt gesaneerd

Zijspoor



- Behouden
- Wordt gesaneerd
- Ntb
- In studie
- Is gesaneerd
- Geen urgentie

How do we pay for this?

Removing switches is more expensive than one-to-one renewal.

Nevertheless:

Every available Euro should be invested in reducing our operational costs

- Maintenance and renewal budgets: Every Euro that is saved by removing a switch, can be invested in the removal of that switch. This is calculated over a 15-year time period (or up to 30 years for specific cases, authorised by the board).
- Capacity improvement budgets: these budgets are small, but the design of capacity improvement projects fully incorporates the simplification philosophy. This also goes for new yards, 740m tracks etc.

The importance of high frequencies

We would like to further increase frequencies during the coming years. First of all, because higher frequencies help to accommodate & stimulate growth, but there are more reasons:

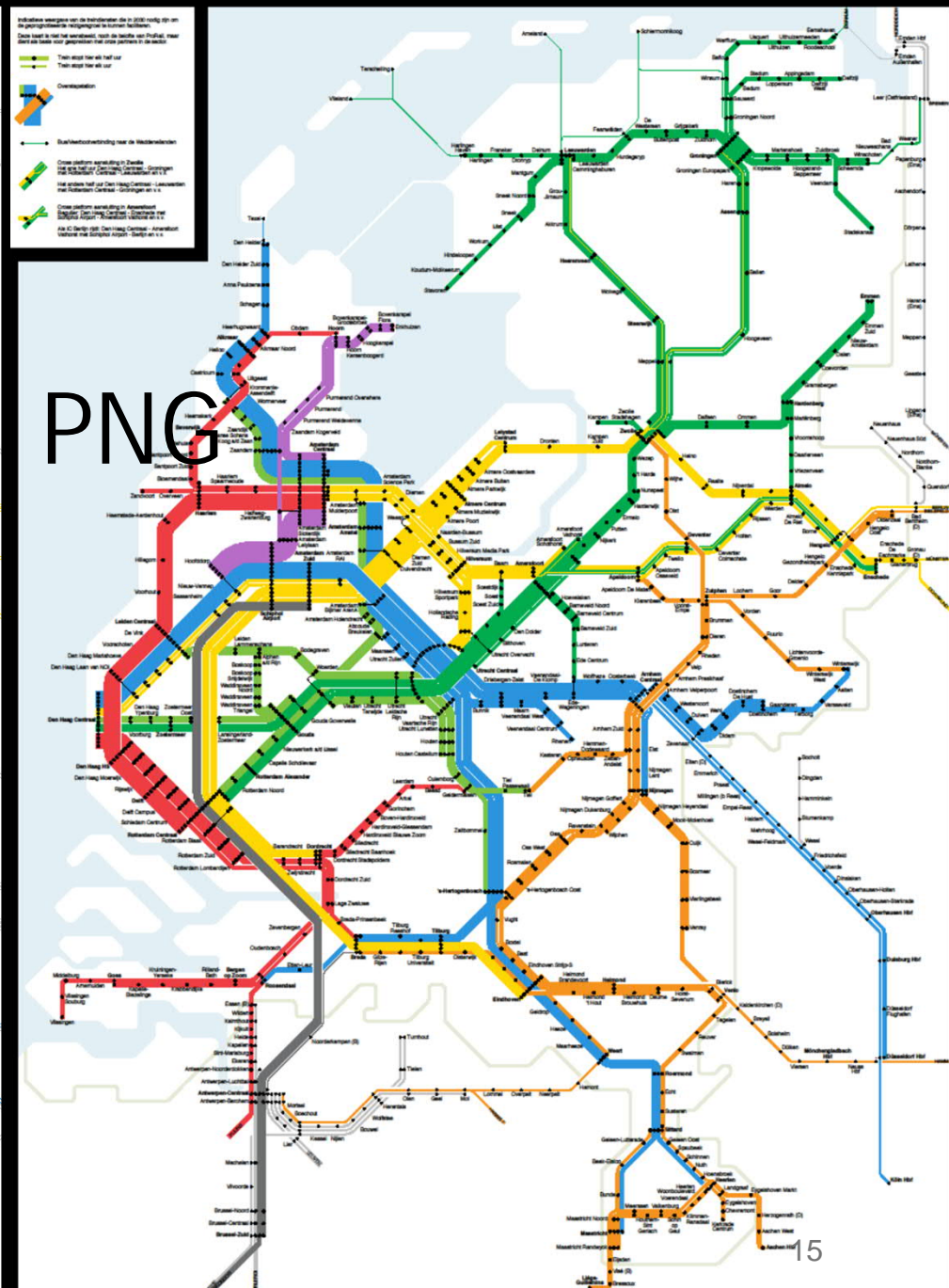
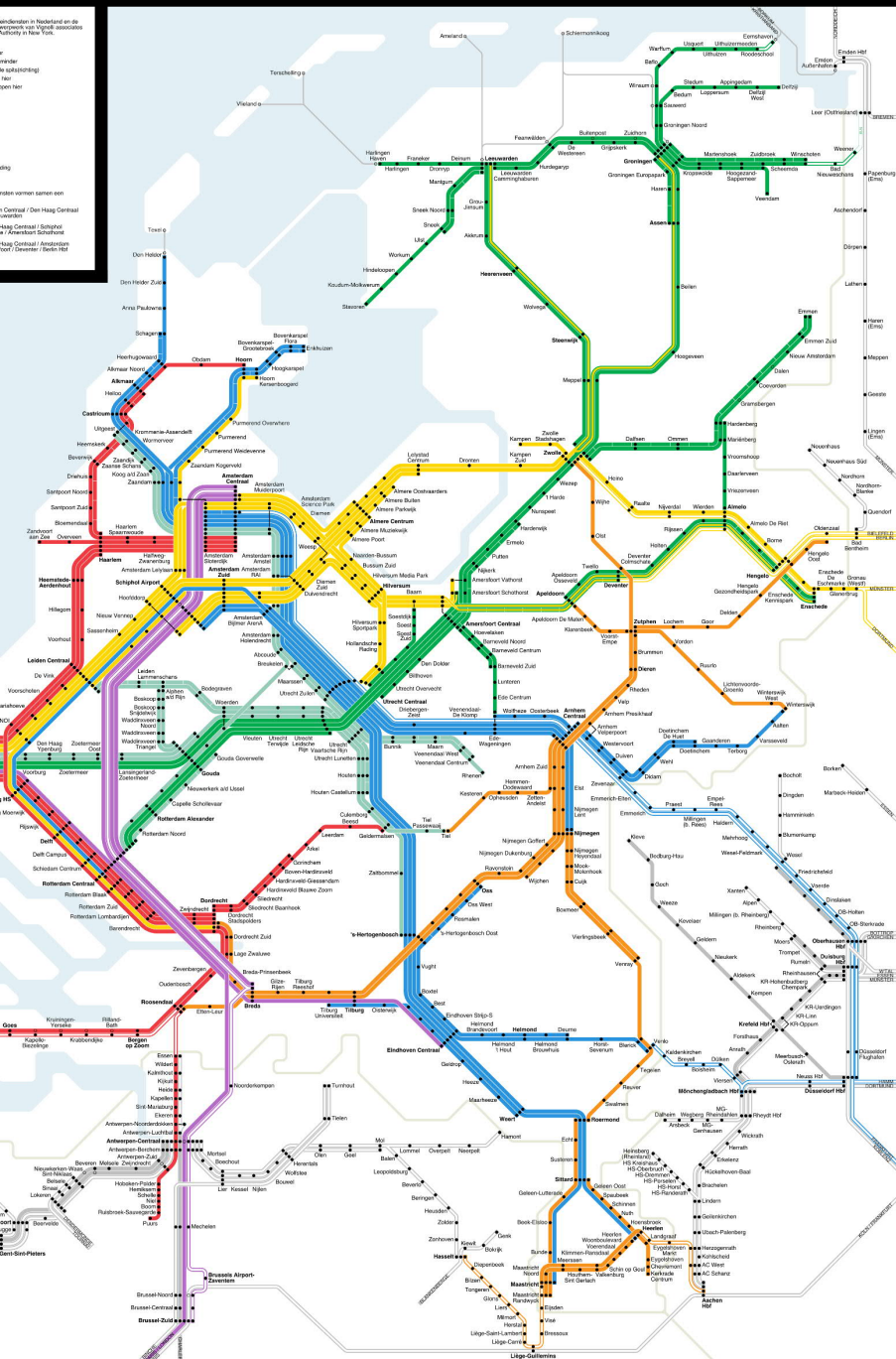
- Improve transfer times => as most local services (including bus/urban rail) run in a 15' interval, we are studying 8x per hour as an improvement to the 10' frequencies.
- Higher frequencies allow us to reduce travel times (with more trains running, we can diversify between semi-fast, fast and super-fast services)
- Improve operational efficiency: "Railroads only make money when the trains are moving."

The challenge: this obviously requires a lot of infrastructure capacity, but there are no plans to invest in more tracks

Overzicht van Nederland

2022 Het Aanbod van ProRail

2030

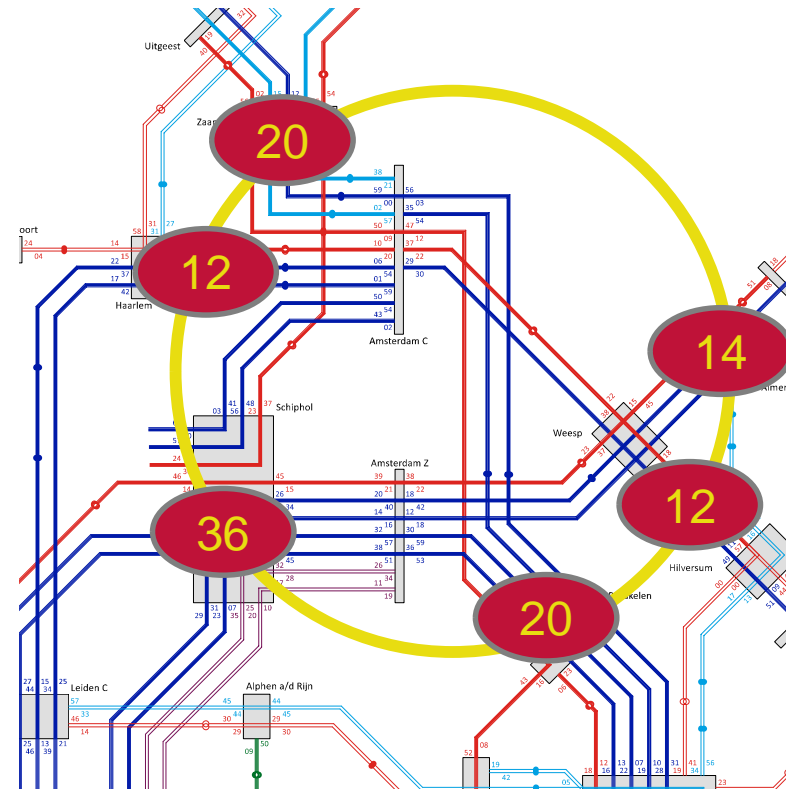


The ultimate puzzle?

In 1970, we successfully introduced the world's first integrated 'takfahrplan'. We continued to build on this principle for over 50 years: adding some trains, adding some infrastructure, etc. etc.

With our reference timetable for 2030, we reached "the end of the line". All six gateways to Amsterdam have been "maxed out" ...

...and there are no realistic railway infrastructure projects to solve this.



GAME  OVER

The way forward: give up holding on to some "holy cows"

- "S-Bahn" separation of flows
- Metro to Schiphol
- Rerouting of freight

Plus: system-wide improvements (ERTMS / ATO / 3kV / single-person operation)

