Organisation of Rail Transport: A Case Study in Lombardy

(and some other suggestions...)

Giorgio Stagni

Milano, 17.10.2022

Originally written for Politecnico di Milano. Published on www.stagniweb.it in June 2023.

Table of Contents

Railway Is... Seaside!

...and international services

E.444.084, San Lorenzo (IM), 29/10/2016 - Giorgiò Stagni

Railway Is... Alps!

Railway Is... Wintertime!

Safe into the snow (...?)

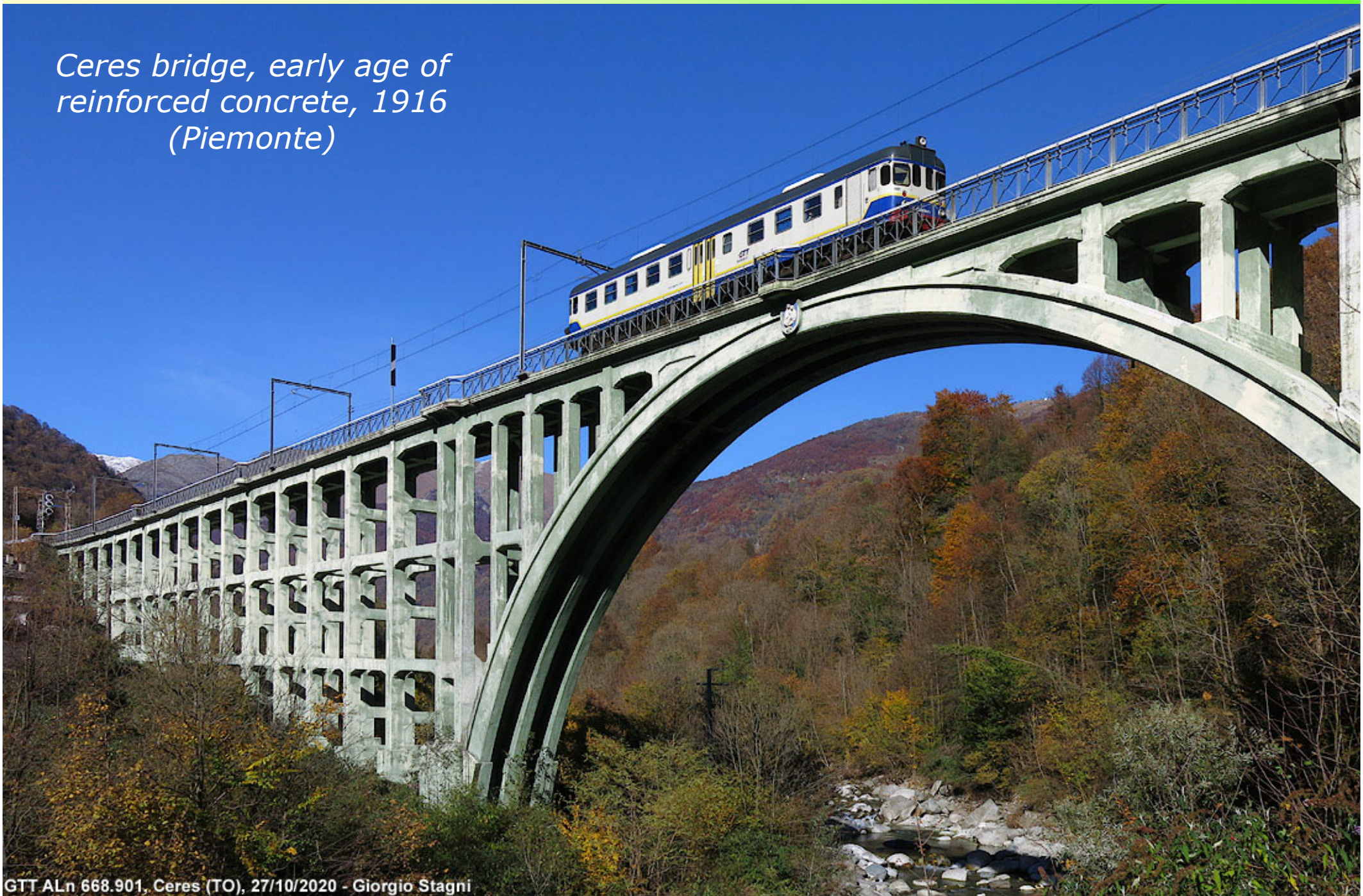
ALn 501, Nus (AO), 24/12/2017 - Giorgio Stagni

Railway Is... Industrial Revolution!

The age of steam, coke & steel

Railway Is... Technical challenges!

along 180 years of history



Railway Is... Architecture!

Montechiaro d'Asti, Giacomo Sutter, 1912.

Morgex, traditional architecture of Aosta valley, 1929.

Casletto-Rogeno (Lombardy): *the platform as a meadow!*

Salsomaggiore Terme (Emilia), Art Deco 1937.

Railway Is... Biodiversity!

"One Nation, One Rail"

Suburban railway in high density metropolitan area, Como.

High speed train ETR.500 (1999), in Milan historical station (1931)

Italian classic diesel railcar ALn 668 (built 1958-1985), inner Sicily.

Traditional long distance night service: pilgrims from Lourdes

Railway Is... Biodiversity!

Narrow gauge is a railway too!

Cog railway, Genova-Granarolo, 1929.

3 kV DC railcar, Genova-Casella, former Ora-Predazzo railway, 1929.

Rome-Centocelle tram-like urban railway.

Diesel railcars around Etna Volcano, Sicily.

Basic Data on Railway Systems

Railways: Subjects Involved

Network managers

- Management of train circulation
- Maintenance of tracks, stations, catenary
- Timetable planning
- Information to users
- Cleaning of stations

RFI

Ferrovienord

- Same as RFI, plus buying trains

Holding

FS

FNM

Railway operators

- Trains (train drivers and train guards)
- Train maintenance
- Cleaning of trains
- Ticket offices

Trenitalia

Regional trains (with subsidy)

- Regional
- Freight
- Long distance

Intercity (with subsidy) Frecciarossa, argento, bianca (without subsidy)

Trenord *

Regional and suburban trains in Lombardy

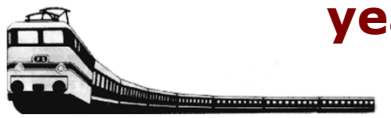
* Previously: LeNORD.
Since May 2011: Trenord, 50% FNM and 50% Trenitalia

Regional Railway: a Subsidised System

- **No regional railway service can gain enough money from tickets. It always needs subsidies**, not only in Italy but everywhere in the world
- Subsidy paid by Regions covers Trenitalia's costs and the *access charge*, i.e. the price applied by the network manager (fixed by law) to run on its tracks
- Service contracts should cover a minimum of **35% of costs with tickets** (i.e. max 65% with subsidy)
- Ticket incomes of main lines "sustain" small lines where the number of passengers is lower. *This is absolutely normal and complies with Italian law* (which considers the parameter of 35% for the whole contract, not for single lines)

An example (approximated values!):

- Cost: **18 euros per km** (12 from subsidy and 6 from tickets)
- A trip of 50 km has a cost for Trenitalia of 18 x 50 = 900 euros and Region pays a subsidy of around 12 x 50 = 600 euros
- For 1 Year, subsidy is 600 x 365 = 220.000 euros
- If there are 20 trips per day: **4,4 milion euros per year**
- A contract service has an average value of **100 milion euros per year** (from 27 of Basilicata up to 450 of Lombardy)

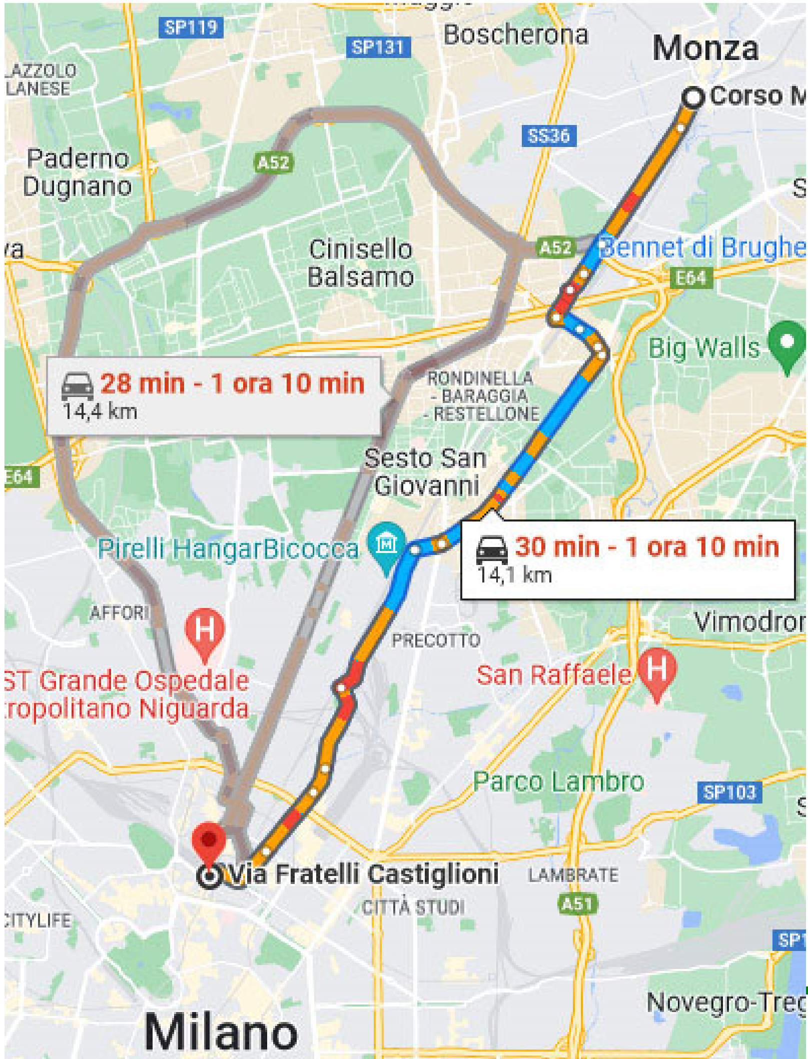


Public Transport Must Be Effective

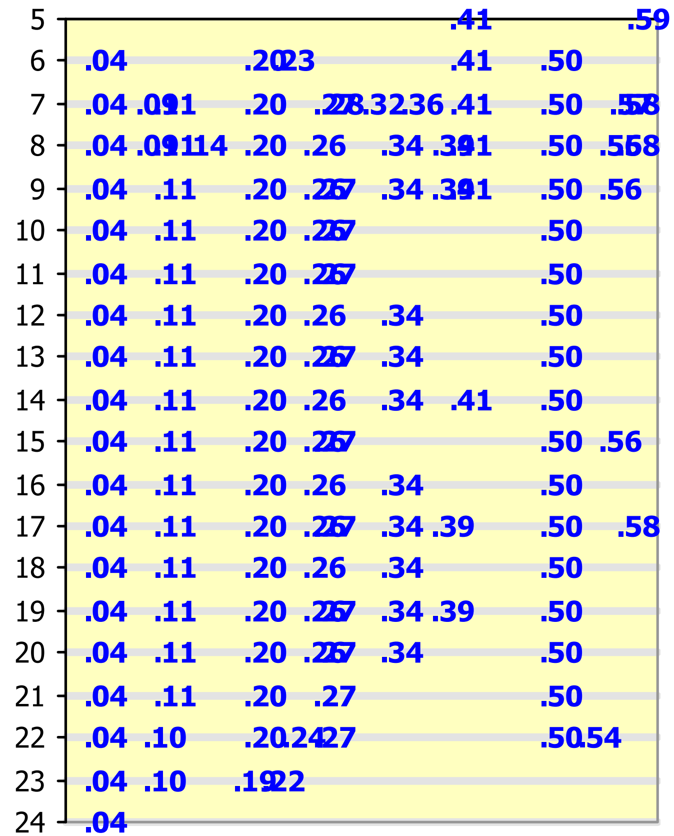
Traffic jam = effective public transport

Monza-Milano Garibaldi **by car**:
- at least 28 minutes without traffic
- Google says **1h10 with traffic**

Monza-Milano Garibaldi **by train**:
- at least 7 trips per hour
- **in 17 minutes, all day**



MONZA - ven 4/10/13
(verso SESTO S.GIOVANNI)



Expensive car fuel = effective public transport

Monza-Milano Garibaldi **by car**:

- **3 €** (from ViaMichelin, no congestion), each trip
- in a month, it would cost 135 € *(45 trips)*

Monza-Milano Garibaldi **by train**:

- 2,30 € (single trip)
- with a 42 € monthly pass, it is only **95 €cents per trip** *(45 trips per month)*

Io Viaggio Ovunque in Lombardia:
(monthly pass for the whole public transport network in Lombardy)

- 110 € per month
- equal to **2,50 € per trip**
- it is less expensive than car, even in the short route from Monza to Milan (12 km)...
- ...and you can travel along the whole Region!

io viaggio
ovunque in Lombardia

➢ *But what happens if we are 2 or 3 in one car? Is railway system giving us an answer?*

PT needs subsidies: it must be effective

Public transport is not expensive for citizens because **it receives subsidies** from Regional Government:

- according to Italian law, covering up to 65% of costs
- in Lombardy around 52% (Ticket revenues/Costs=48%)

- A system requiring subsidies **needs to be used a lot**, otherwise it cannot be **efficient**.
- Planning Authorities (Regions) **must create an effective system** (i.e. very used by citizens), otherwise they are wasting public money.
- Also **infrastructure** costs a lot of money, and it is always paid by State/Region
- The only way to repay those costs (already spent) is to use infrastructure for a large number of trains

Ordered system = effective system

We must create a "clear" and ordered system
We need to have a train always available

Public transport is truly effective ***if:***

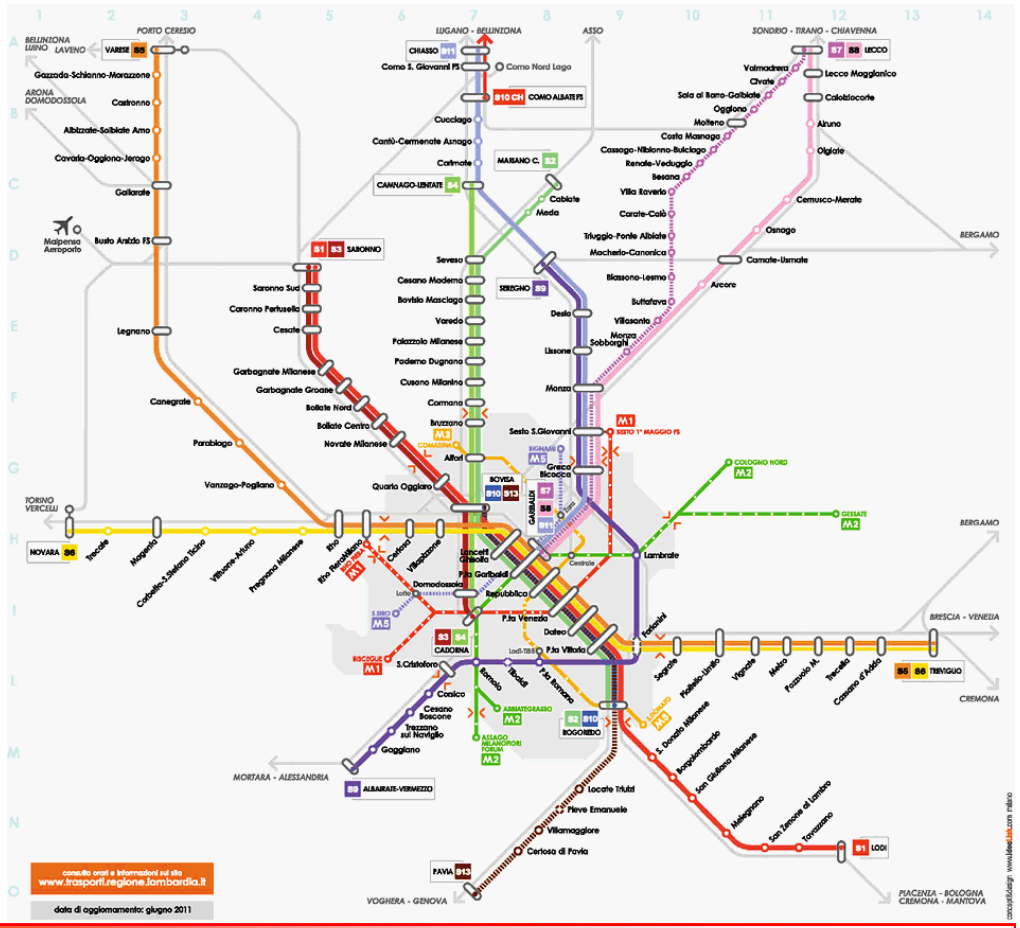
- it can be "understood" by users
  - ordered, structured, with "numbered" lines
  - with a clear and competitive fare system
- it is available during the whole day
- it reaches every place
  (with a sequence of connected services, when necessary)

Public transport: a common language

All suburban and metropolitan railway systems **speak the same language**: you do not have to create anything; just copy what other cities already use and inform your citizens about the new system!

TURIN - SFM

MILAN - S Lines



Give more quality = gain more passengers

Monza-Molteno-Lecco line was included in the list of **lines to be closed** in 1985.

Lombardy Region has increased the service and **extended it to Milan**.

In 2011 **11 modern GTW 4/12 DMUs** by Stadler arrived, paid by the Region (**65 MEuro**), completely replacing the previous railcars built in the 1970's.

Passengers per day increased from original 8000 to **14'000 (+75%)**.

Railcar built by Fiat in 1978 (used up to 2011)

New Stadler GTW DMU (since 2011)

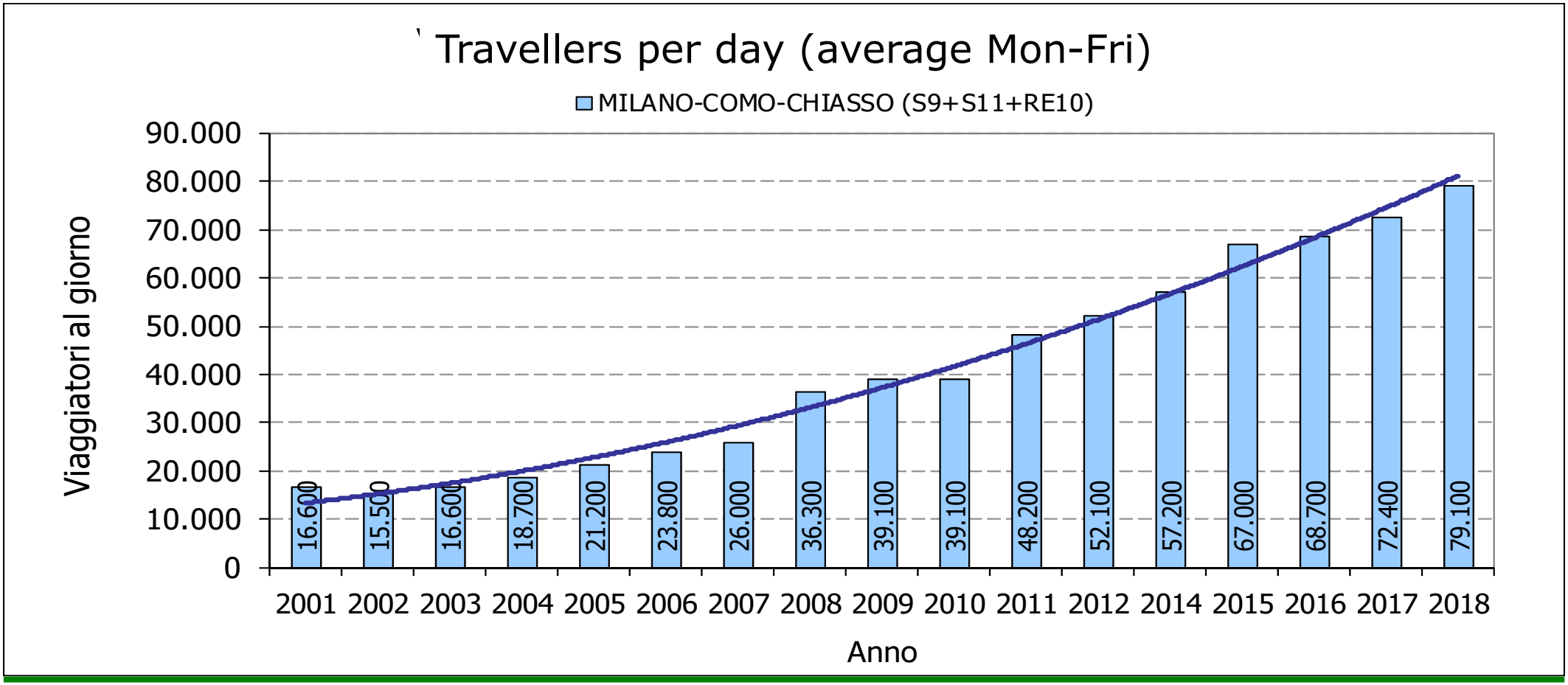
Build an ordered system = gain more passengers

The Milano-Chiasso line has been progressively improved and structured, introducing two S Lines: **S9** **S11**

The result:

Milano-Chiasso line between 2001 and 2018:

- from 16'000 to 79'000 passengers per day = **+375%**



Give good information = gain more passengers

- a good service
- true competition regarding the **price**

but mainly:

- an impressive advertisement: **"the train makes the difference"!**

If it works for .italo, why should it not work also for regional transport?

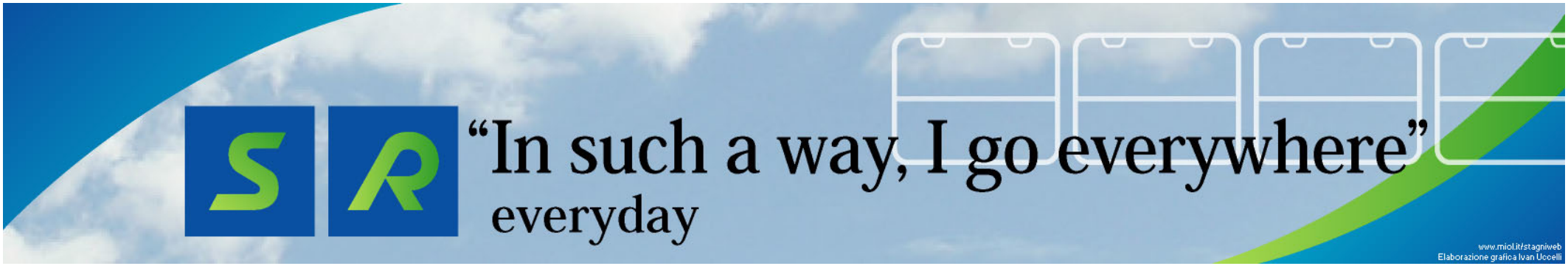
Let us summarise key ideas on public transport

- Traffic jam = effective public transport
- Expensive car fuel = effective public transport
- PT needs subsidies: it must be effective
- Ordered system = effective system
- Public transport: a common language
- Give more quality = gain more passengers
- Build an ordered system = gain more passengers
- Give good information = gain more passengers

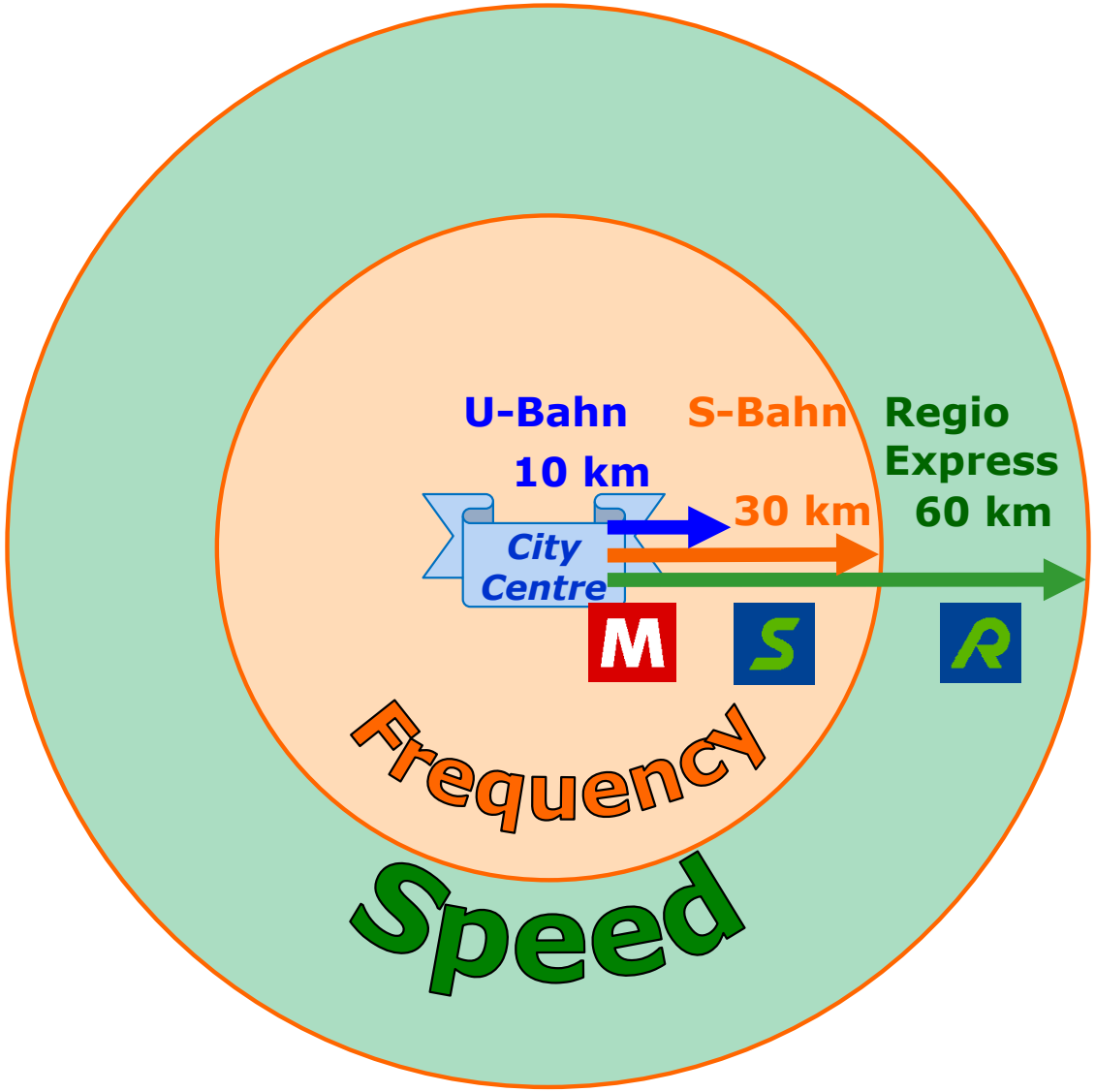
Implementing a Master Plan: Hardware and Software

Guidelines: Moving Always, Moving Everywhere

- "Moving" **everywhere**,
  not only towards Milan
- "Moving" **always**,
  not only in peak hours
- "Moving" **people**,
  not trains and buses
- Building a **system**,
  not just a set of trains



A Structured and Ordered System…



A structured and ordered system **able to offer the best performances for each kind of trip**

- More **frequency** when it is required *(closer to the city centre)*
- More **speed** when it is important *(running far away from the city centre)*

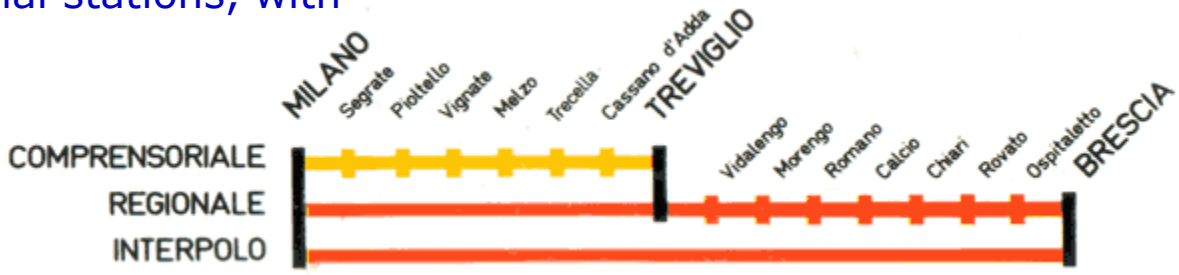
...Coming from Our Past

The structure of Regional Railway Service first appears in Transport Master Plan of Lombardy Region issued in **1982**, when building of **Passante Ferroviario** was started (finished in 2008!)

The Master Plan already defined a hierarchy of railway services for regional connections:

- **the suburban service** ("comprensoriale", presently the S-lines), for areas closer to Milan, stopping in each station, with a fixed frequency of at least 30 minutes;
- **the regional service** ("regionale", presently Regional), to connect Milan with areas beyond the suburban border, travelling without stops in the suburban area and then stopping in the other stations;
- **the direct service** ("interpolo", presently RegioExpress), to connect main regional stations, with few intermediate stops.

Original leaflet dated 1982 (description of services is taken from this leaflet)

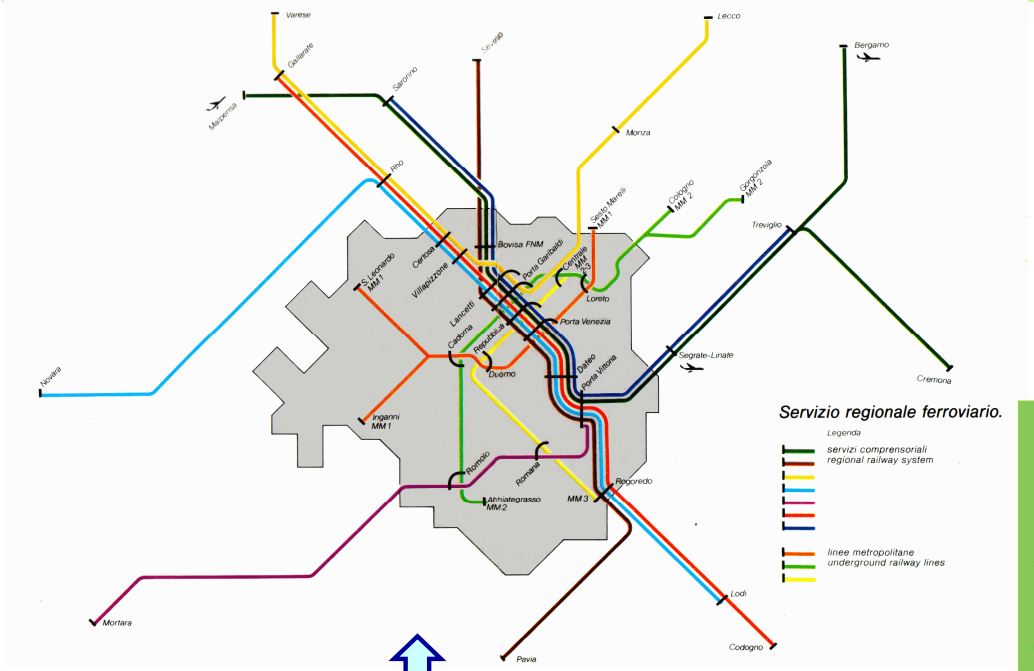


Why do we need a masterplan

- Railway is developed very slowly *(26 years to finish the Passante of Milan).*
- Railway needs an "**hardware"** that can be achieved only with a long term vision.
- Passengers measure the success and efficiency of a public transport **not from infrastructure but on service offered** (frequency, timetable, travelling time).
- A transport masterplan **is not sufficient** to ensure success of a transport system, but **it is necessary** to develop the hardware according to the service that we want to obtain.

- We must remember that in public transport **improving the service always requires more subsidy**. If we build a new infrastructure, we must be aware that **it will "cost" even when it is finished**, because we will have to pay for the service.

Yesterday and Today



1986: planning the system

2011: the final network

Between the two maps:
25 years.

Why?

Public Transport Is Made of *Hardware* and *Software*

1982-2008: The **Passante ferroviario** is built

2005-2009: other new railway infrastructures are ready:

- ***4 tracks*** *Milano Bovisa-Cadorna, Milano-Treviglio*
- ***2 tracks*** *Treviglio-Bergamo, Carnate-Lecco, Milano-Albairate, Saronno-Busto Arsizio*
- ***High Speed Lines*** *to Bologna and Torino*
- *12 new* ***stations*** *in suburban area*

2007-2012: **107 new trains**

- *80 Double-Decker AnsaldoBreda TSR*
- *19 Diesel Stadler GTW and 2 Diesel Pesa*
- *6 Alstom trains for airport services*

} *Hardware.*

Only if we add an appropriate "software", railway can be really useful. Our software is the **train timetable**.

2004-2012: the new suburban service (**S Lines**) appears

Hardware does not guarantee success of a railway system, but it is surely a **requirement** for the new service and for the accomplishment of the Master Plan designed in 1982.

S-Bahn… a Train Similar to an Underground System

- **12 S-Lines** designed as a suburban system around Milan
  - ✓ direct access to city centre and connection to the underground network
  - ✓ frequency of **30 minutes**
  - ✓ running all the day, all days in year
  - ✓ easy connection with other trains and buses
- **new rolling stock,** suitable for suburban service
- specifically designed **information & maps**
- a **simple and unique fare** for the whole regional system
  - ✓ new "STIBM" integrated ticket in Milan-Monza area since 2019

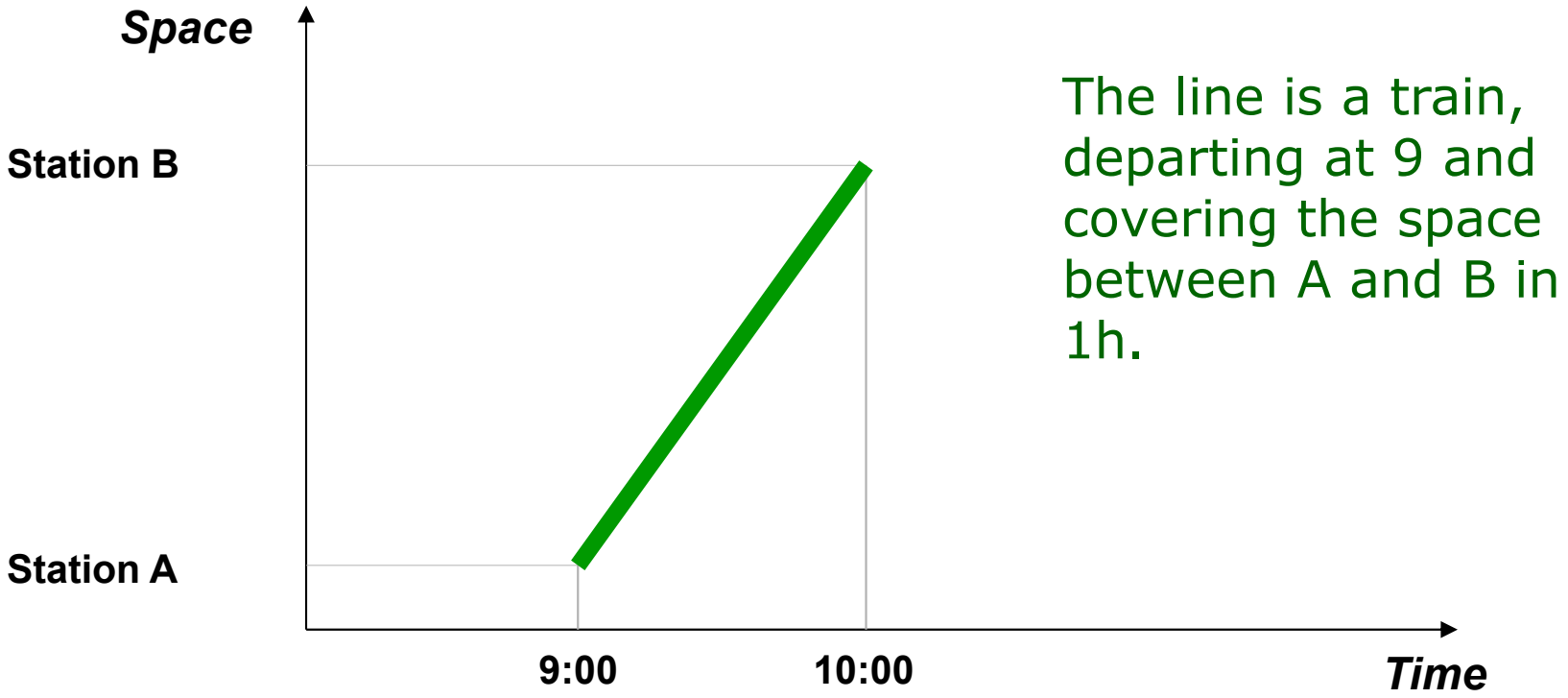
- **First S-Lines running since December 2004**
- **With S13 to Pavia starting in December 2011 the S network is almost completed!**

After ten years, the S Lines of Milan are a fundamental part of the experience of many passengers

Our Tools: Timetables and Charts

Graphical Timetable: Basic

- The tool used to regulate and define the services is the **timetable**.
- **Graphical timetable** is the representation of a train on a space(time) diagram.

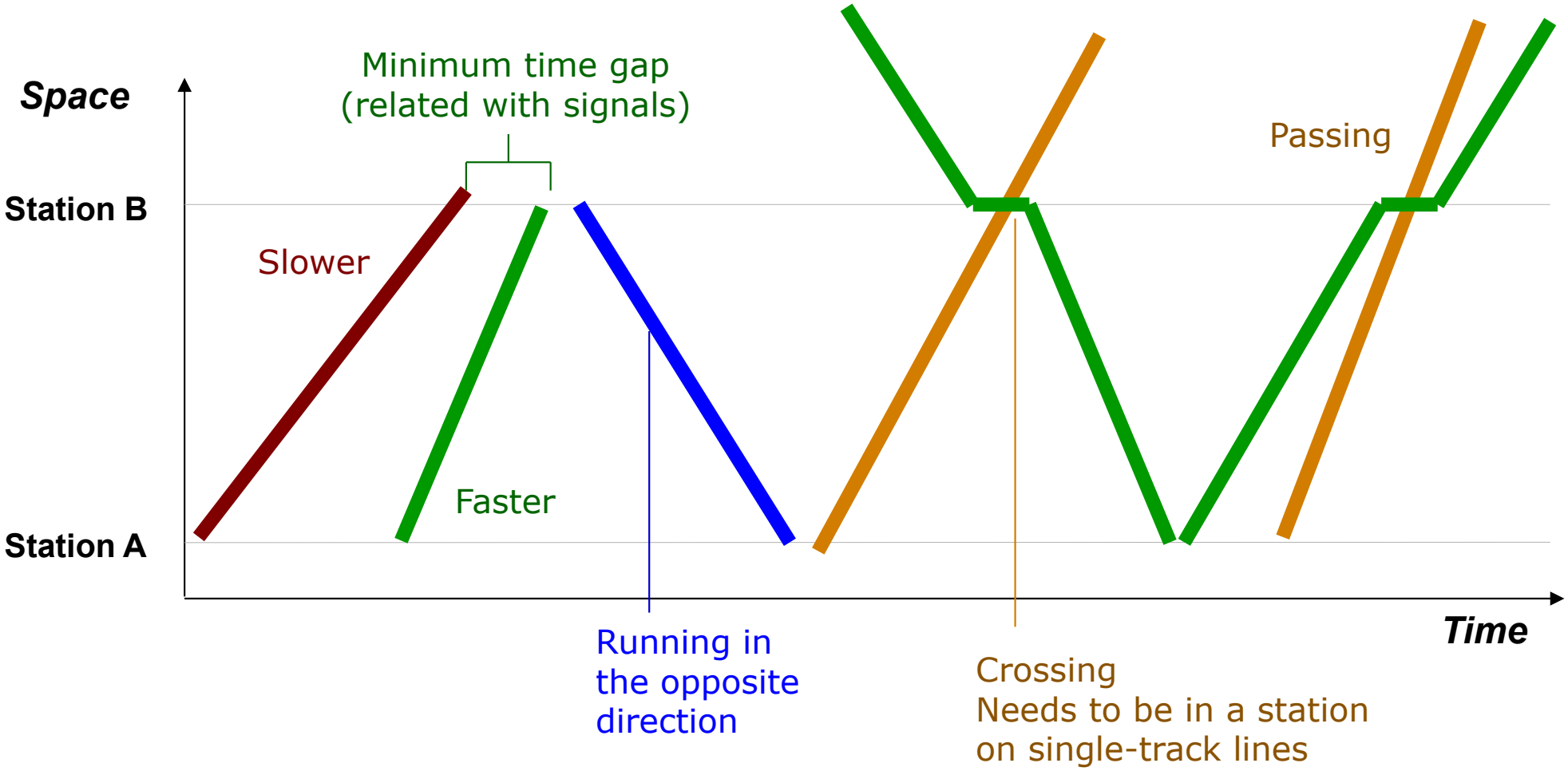


The line is a train, departing at 9 and covering the space between A and B in 1h.

German speaking people put Time on Y Axis and Space on X.

Graphical Timetable: Basic 2

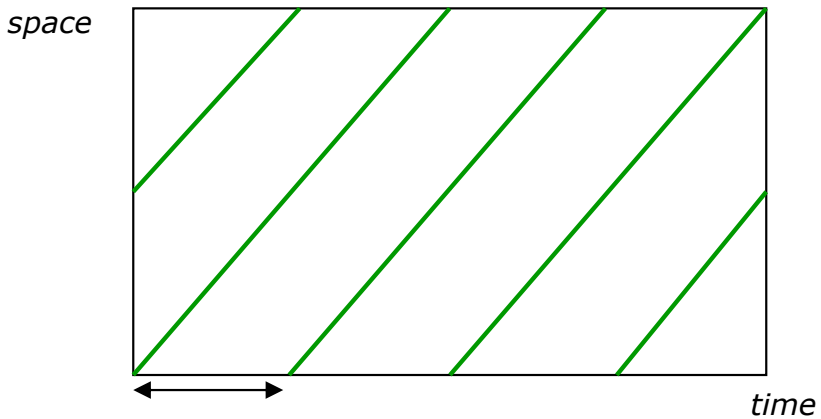
- Familiarising with timetables:



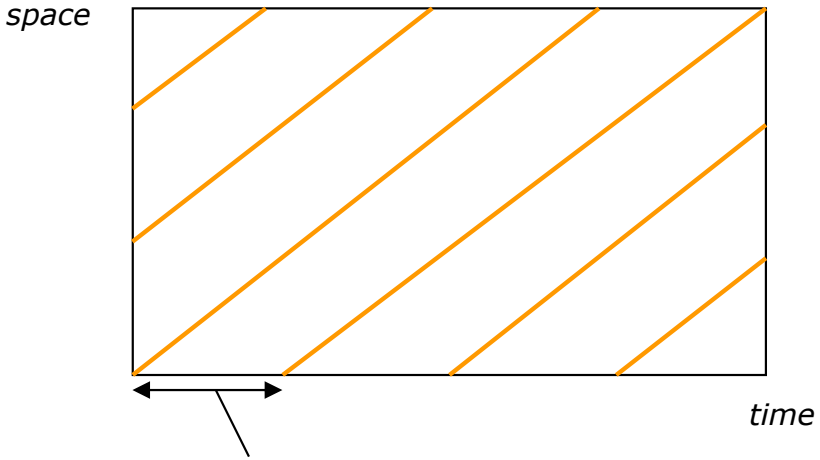
Timetabling and Line Capacity

The capacity of a line depends (also) on the way the timetable is built.

Fast trains only

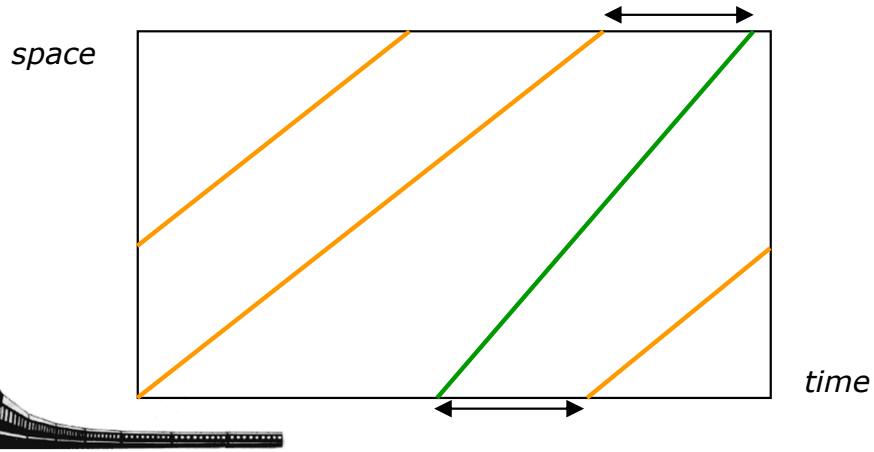


Slow trains only



Minimum headway between 2 trains

Fast and slow trains together

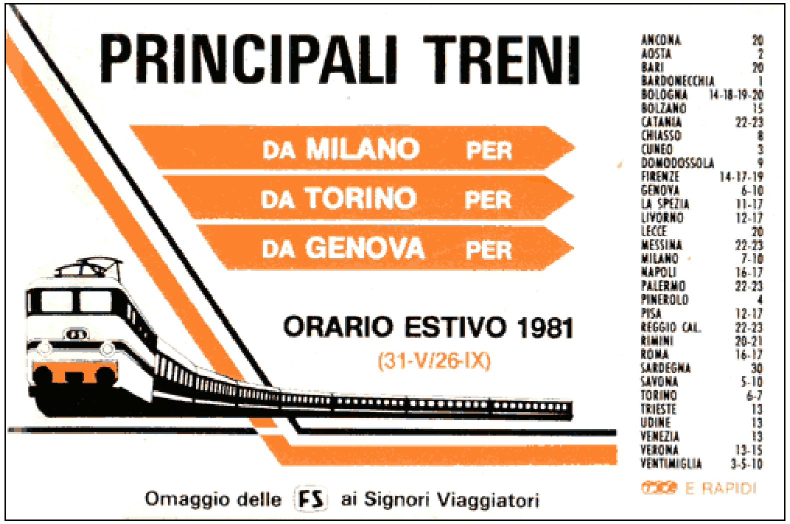


The capacity of a line could be increased if timetable is homogeneous (all trains have the same speed).

But in real life it is necessary to find a **compromise** between faster and slower services!

Designing the Timetable

1981: “Prehistoric” Timetables even on Main Lines



Milan-Rome:

- Three *Trans Europ Express* (around 6h), each one with its own name:
  - “Settebello” (ETR.300)
  - “Vesuvio” (to Naples)
  - “Ambrosiano”
- One *Rapido* to Naples
- Two *Rapido* on partial route Bologna/Florence-Rome

That’s all!

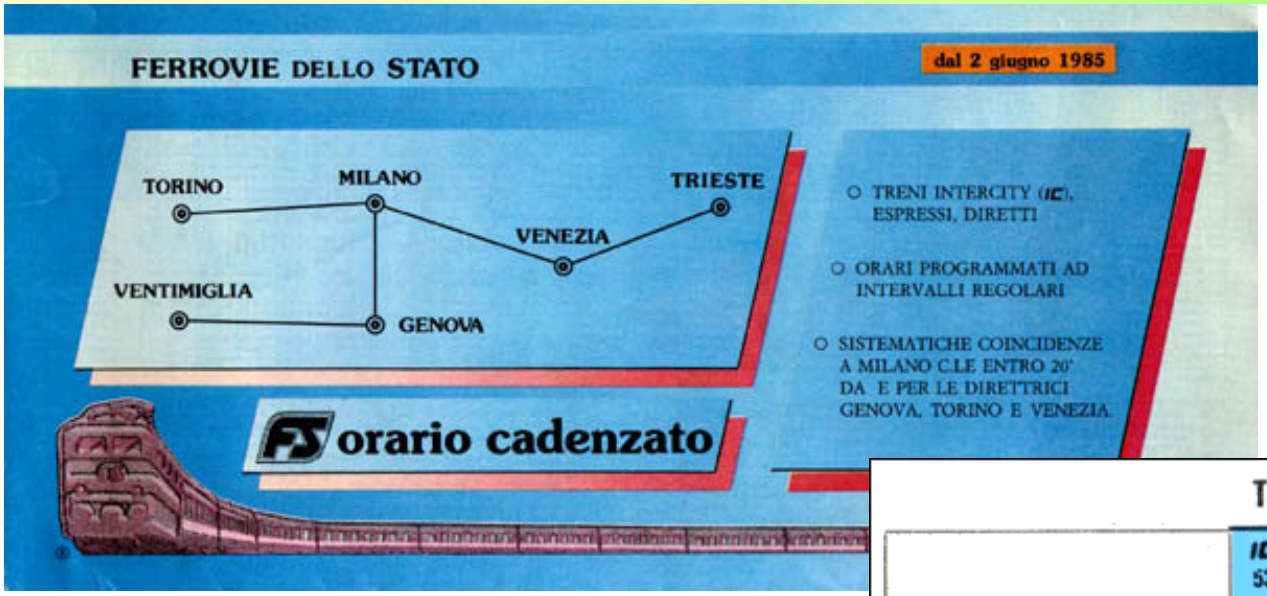
1 c	1	1	a 1		1		7		1	1		1	b	1 a	1 d
...	7.50	...	11.50	12.50	16.50	p.	MILANO C.	a.	13.55	17.40	20.30	⊢⊣	23.05	23.42	...
⊢⊣	9.42	13.05	13.47	14.55	18.53	p.	BOLOGNA C.	a.	12.00	15.46	18.20	17.12	21.07	21.48	⊢⊣
6.50	10.59	14.17	15.01	16.09	20.08	p.	FIRENZE S.M.N.	a.	10.42	14.23	16.55	15.57	19.41	20.34	22.10
9.38	13.48	17.13	17.46	19.15	23.05	a.	ROMA TERM.	p.	7.50	11.27	13.45	13.00	16.25	17.40	19.12
...	...	...	20.10	21.42	...	a.	NAPOLI C.	p.	...	...	11.30	...	...	15.30	...

a Napoli Mergellina. – b Milano Lambrate. – c Sospeso ⑦. – d Sospeso ⑥.

Railway comes form an history of **fewer trains**.

Increasing the **number of trains per day** (and thus the number of **seats**) is a good measure of "progress" in railway, even more than increasing **speed** and performances.

1985: a New Era in Italian Timetables



The first "really new" timetable in FS history: a structured service in North-West Italy.

Every 2 hours:

- Intercity Turin-Milan (1h35)
- Direct train Turin-Milan (1h47)
- Intercity Milan-Venice (2h45)
- Direct train Milan-Venice (3h)
- Intercity Milan-Genoa
- Express train Milan-Ventimiglia
- Direct train Genoa-Ventimiglia

TORINO - MILANO - VENEZIA - TRIESTE

	IC 53			Dir 2107		Dir 2237	IC 55	Dir 2109		IC 69	Dir 12289 ⓫	Expr 1851 ⓬	Dir 2111
TORINO P.N.	11.10			11.53		12.42	13.10	13.53		15.10	15.33		15.53
TORINO P.S.	11.17			12.01		12.52	13.17	14.01		15.17	15.41	15.56	16.01
CHIVASSO	|			12.17		|	|	14.17		|	15.58	|	16.17
SANTHIÀ	|			12.35		13.32	|	14.35		|	16.39	|	16.35
VERCELLI	11.58			12.48		per	13.57	14.48		15.58	16.54		16.48
NOVARA	12.13			13.04		Biella	14.13	15.04		16.13	17.26	17.04	17.04
RHO	|			13.25		S.P.	|	15.25		|	arr.	arr.	17.25
MILANO CENTRALE ..... a	12.45			13.40			14.45	15.40		16.45			17.40
	IC 65 (a)	Expr 167 ⑦	Expr 567	Expr 525 (b)	Expr 1781 ⑧	Dir 2253 ⑨	IC 67	Expr 527	Dir 2255 ⑩	↓			Expr 529
MILANO CENTRALE	13.05	13.20		14.00	14.10	14.20	15.05	16.00	16.20	17.05			18.00
MILANO LAMBRATE	|	|		|	|	14.27	|	|	16.27	|			|
BRESCIA	|	|		|	|	15.19	|	|	17.19	|			|
DESENZANO-SIRMIONE	13.51	14.12		14.48	15.03	15.43	15.51	16.48	17.04	17.42	17.51				18.48
		14.28		15.04				17.04							19.04
VERONA P.N.	14.30	14.58	15.05	15.33	15.47	16.40	16.30	17.33	18.40	18.30			19.33
VICENZA	14.59	15.32	15.38	16.06	arr.	17.30	16.59	18.06	19.30	18.59			20.06
PADOVA	15.20		16.00	16.30		18.00	17.20	18.30	20.00	19.20			20.30
VENEZIA MESTRE ..... a	15.39		16.19	16.49		18.32	17.39	18.49	20.19	19.39			20.49
VENEZIA S.L. ..... a	15.50		16.30	17.00		18.44	17.50	19.00	20.30				21.00
TRIESTE C. ..... a										21.42			

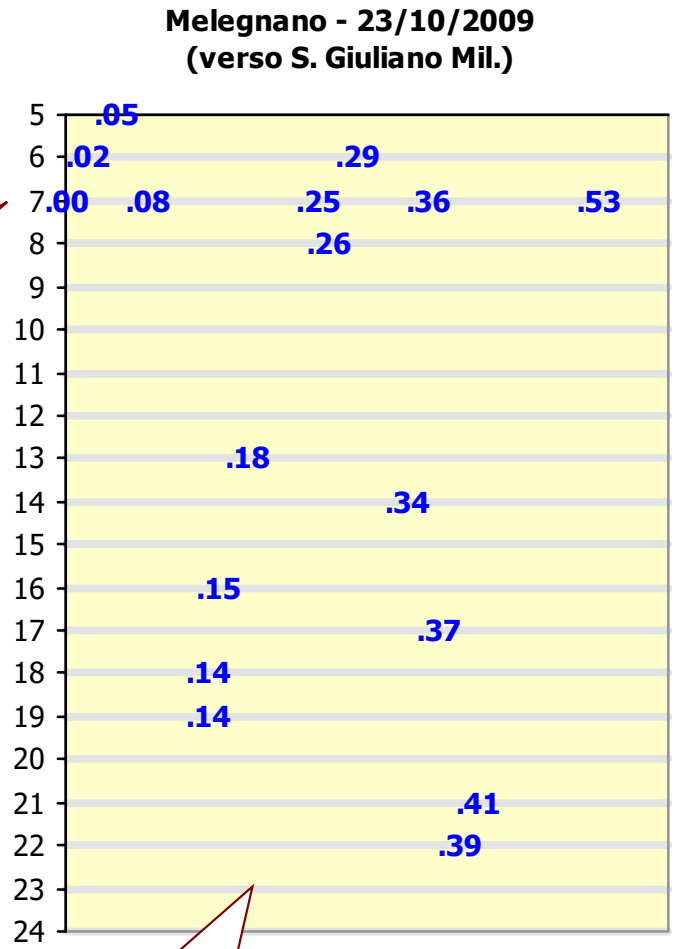
Traditional Timetable

"Focused" timetable

↓

"Charter strategy"

Peak hour trips



Train circulates only if (considered) profitable.

The train is located in the timetable in order to maximise the highest potential demand.

The train is dimensioned according to the foreseen demand.

Minor or secondary traffic flows are left unserved or served by other transport means.

An effective representation of departures from a station!

Regular Interval Timetable

Regular interval timetable

Global approach to mobility (including other modes)

Timetable built to grant the constant availability of service:

- Departures at **regular intervals**
- Constant pattern of **appointments** at specific nodal points

The financial sustainability must look at the whole network and not to single trains (that can be losing).

The benefit for the user of having "always" a train is greater than the cost of having some trains more empty!

Melegnano - 24/10/2011
(verso S. Giuliano Mil.)

5		
6	.09	.39
7	.09	.39
8	.09	.39
9	.09	.39
10	.05	.39
11	.09	.39
12	.09	.39
13	.09	.39
14	.09	.39
15	.09	.39
16	.09	.39
17	.09	.39
18	.09	.39
19	.09	.39
20	.09	.39
21	.09	.35
22		.35
23		.35
24		

Same station, the next year!

Regular Interval Timetable: Why?

Why is regular timetabling important, especially in local transport services?

- Allows the creation of a hierarchic network (train – bus – urban)
- Introduces mono- and multi-modal transport nodes
- Allows the passenger to **arrive at any time to the initial stop, avoiding the use of timetables** also when using more lines.

Increases the quality of the trip

Reduces the perceived cost

Increases number of users on the network

Influences the housing choices in peripheral areas

Diapositiva 41

pb1 MIGLIORARE SUCCSSIVAMENTE CON LAVORO SICILIA

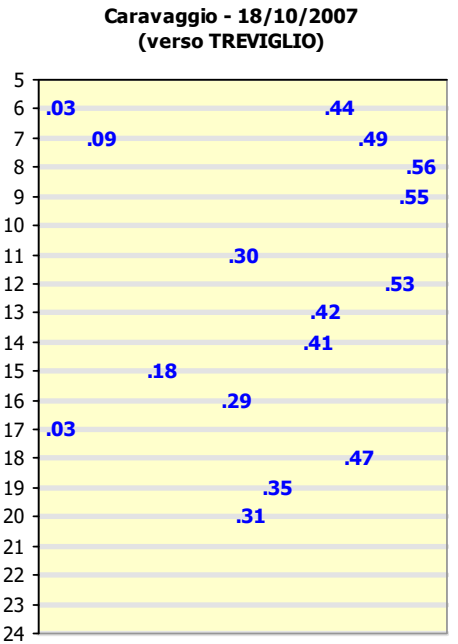
Paolo Beria; 06/01/2010

Simplifying the Service - Regular interval timetable

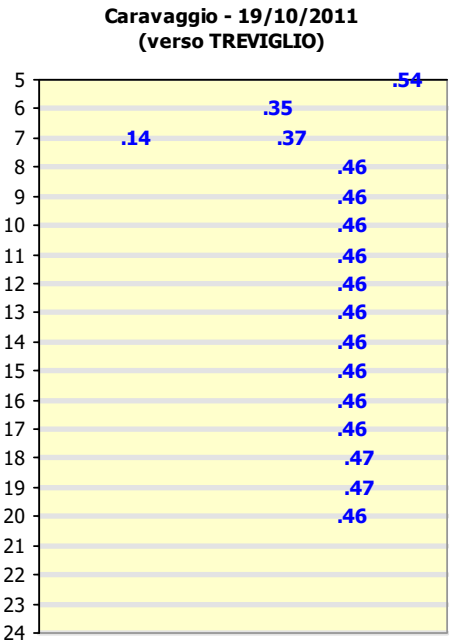
Before and after

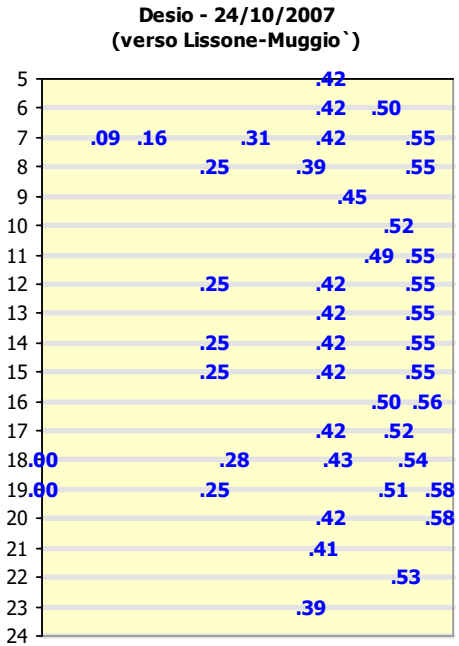
Caravaggio (BG)
(small line, single track)

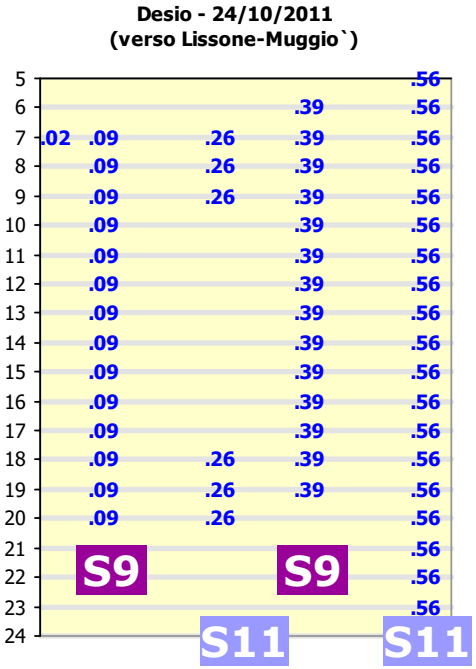
Before



After







Before

After

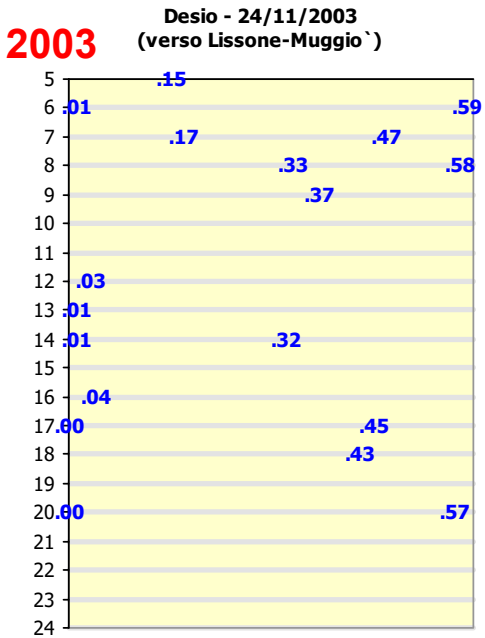
Desio (MB)
(suburban line, high traffic)

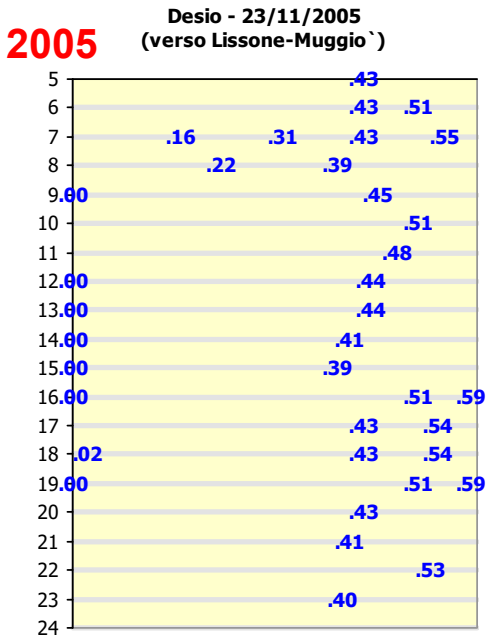
A regular service is **the same answer** both for small lines and high traffic lines. *Even if the total number of trips remains the same.*

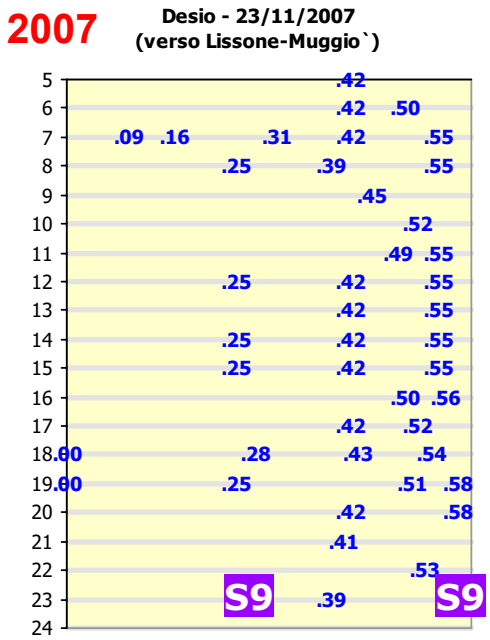
Structuring the Service - Year after Year

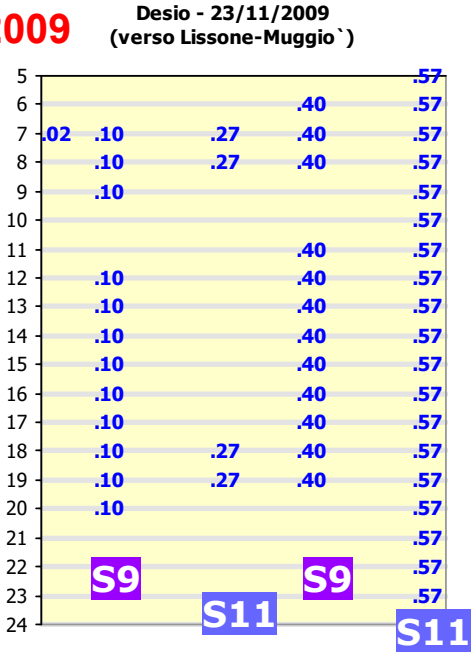
Line Milan-Chiasso 2003-2015

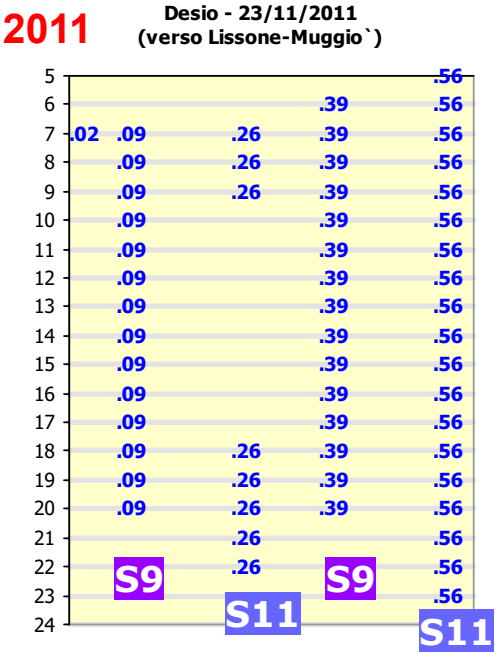
More trains.
More "order".

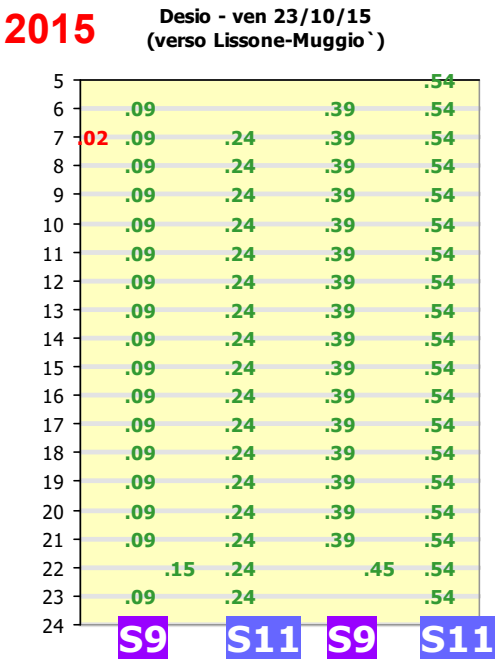












The Ingredients: Timetable Planning

Frequency and travelling time

- *Basic rule (it's just common sense):* **waiting time must be shorter than travelling time**
- On suburban services, travelling time is generally short: **this is why also waiting time must be short.** On S Lines we always need a frequency of at least **30 minutes** (even on off-peak trips).
  - Trains take advantage of street congestion. During the weekend street congestion is generally lower, so train is less competitive.
  - If we have a frequency of 60 minutes on Sunday (or even 120 minutes, as in Turin SFM), the rail service is less expensive for Region, but it is extremely **ineffective**, **because no one waits 60 minutes for a train, if his travelling time is about 15 minutes**. He will drive to the nearest underground station.
  - If the main goal of Region is to reduce subsidy, reducing frequency can be accepted, but, on long term, *it generally brings railway service to failure.*

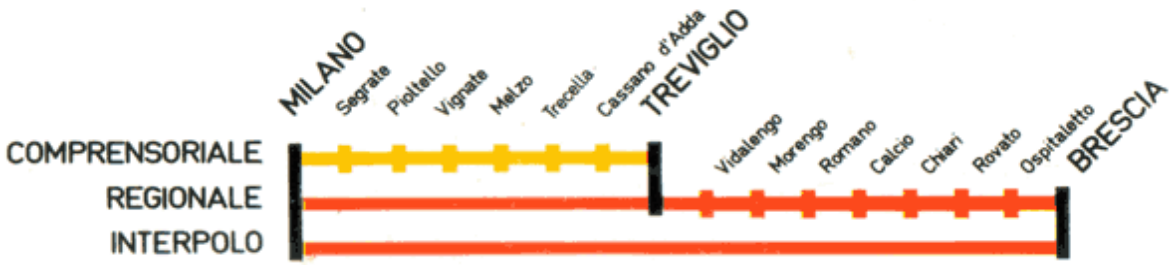
Trip length and number of stops

- When we plan the rail connections (length, final stations and intermediate stops), we must find a **compromise** between opposite goals:
  - rolling stock is used more efficiently if the number of passengers is as constant as possible during the trip
  - in many cases the number of passengers follows a "triangular load": it decreases going from main city to small towns/countryside/mountains (see RegioExpress Milan-Sondrio-Tirano, Milan-Varese-Porto Ceresio)
- The more a train is direct (fewer stops), the more it requires a "**minimum journey**" to capture enough people
  - RegioExpress Milan-Bologna is better than Milan-Parma, Milan-Genova is better than Milan-Tortona
- If road congestion is not extremely high, stations nearest to a large city are **less useful**, because people will generally use bus transport, which has much more stops in the city centre.
  - Be aware that a **short shuttle service** is likely to be **ineffective** if it's run with a train!

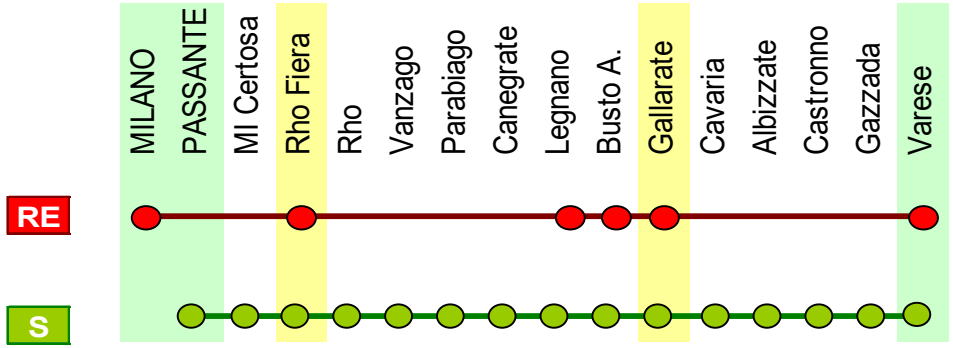
New stations

- When new stations are added along a line, it is generally required to **increase frequency**, because frequency must be inverse proportional to distance between stations, in order to be effective to the users (lower distance = higher frequency)
- Adding a station **decreases average speed** for people coming from another station before the new one. So adding many stations may require to **add a new level of service**: i.e. *Regional* and *RegioExpress*, to keep an acceptable travelling time for everybody (see the example of new stations of Arcene, Levate and Stezzano on Bergamo-Treviglio).
- Stations are generally added as a "compensation" when new infrastructures are built (not only railways, also streets and motorways).
- If frequency is increased, or a RegioExpress service is added, you must remember that **new stations increase costs also in the future**, because they require more subsidy, to cover the new services.
- *... and of course it's better if you find an **agreement** with all stakeholders, **before** building the new station!*

An idea for the future: shorter S Lines – More frequency and seats where they are required

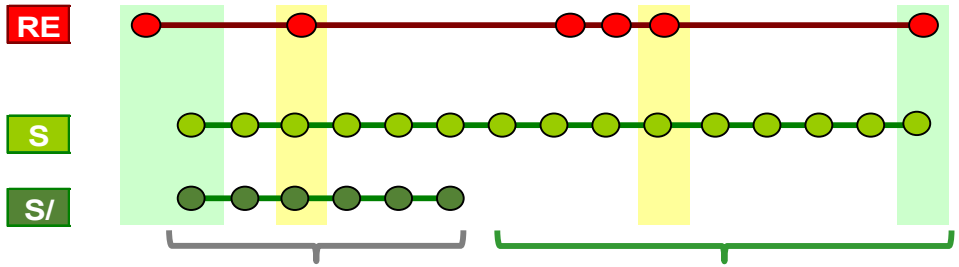


The 1982 masterplan model



The present situation

An example: line S5



An idea for the future

(it needs an infrastructure with enough capacity!)

Higher frequency on peak hours → more seats

Less demand → Smaller trains → More efficient use of the fleet

Tram-trains and non-conventional systems

A more "beautiful" train (or bus) is generally not enough to modify modal choice in a relevant amount, if there is no other improvement: frequency, travelling time, fare system, ...

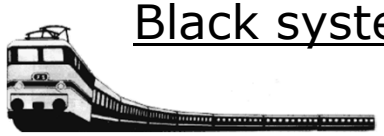
This is true also for non-conventional systems, which usually cost much more than traditional systems, and in some cases simply don't work.

In general, last decades have shown a **Darwinian evolution** of public transport vehicles: trains, underground rail systems, trams, trolley buses and buses won competition. Other systems didn't.

So, every public authority should consider with great care any non-conventional system, especially looking at the recent past:

- *Translohr (bus with single rail)*: Padova, Mestre
- urban cable cars: *Minimetro* in Perugia, L'Aquila
- buses with optical or magnetic guide: *Civis* Irisibus in Bologna; *Stream* Ansaldo in Trieste; *Phileas* in Rimini and Pescara
- Hydrogen buses (Sanremo)

Black systems failed to work.



The Ingredients: New Trains

176 New Trains in Lombardy

In 2017 Lombardy Region starts a new program for replacing most of the old fleet: 176 trains put into service within **2025,** subdivided into 3 models, for a total cost of **1400 million euros** *(average 8 millions per train)*.

1) **105 Double-Decker trains** "**Caravaggio**" built by Hitachi.

Giugiaro Architettura develops a **new livery** for the trains: these are no more the colors of the operator (Trenord).
The new livery will make new trains immediately visible to passengers and will be used for a **new identity** of all public transport in Lombardy (e.g. also tickets, buses, bus stops, ...).

176 New Trains in Lombardy

2) **31 trains of medium size "Donizetti"** by Alstom.

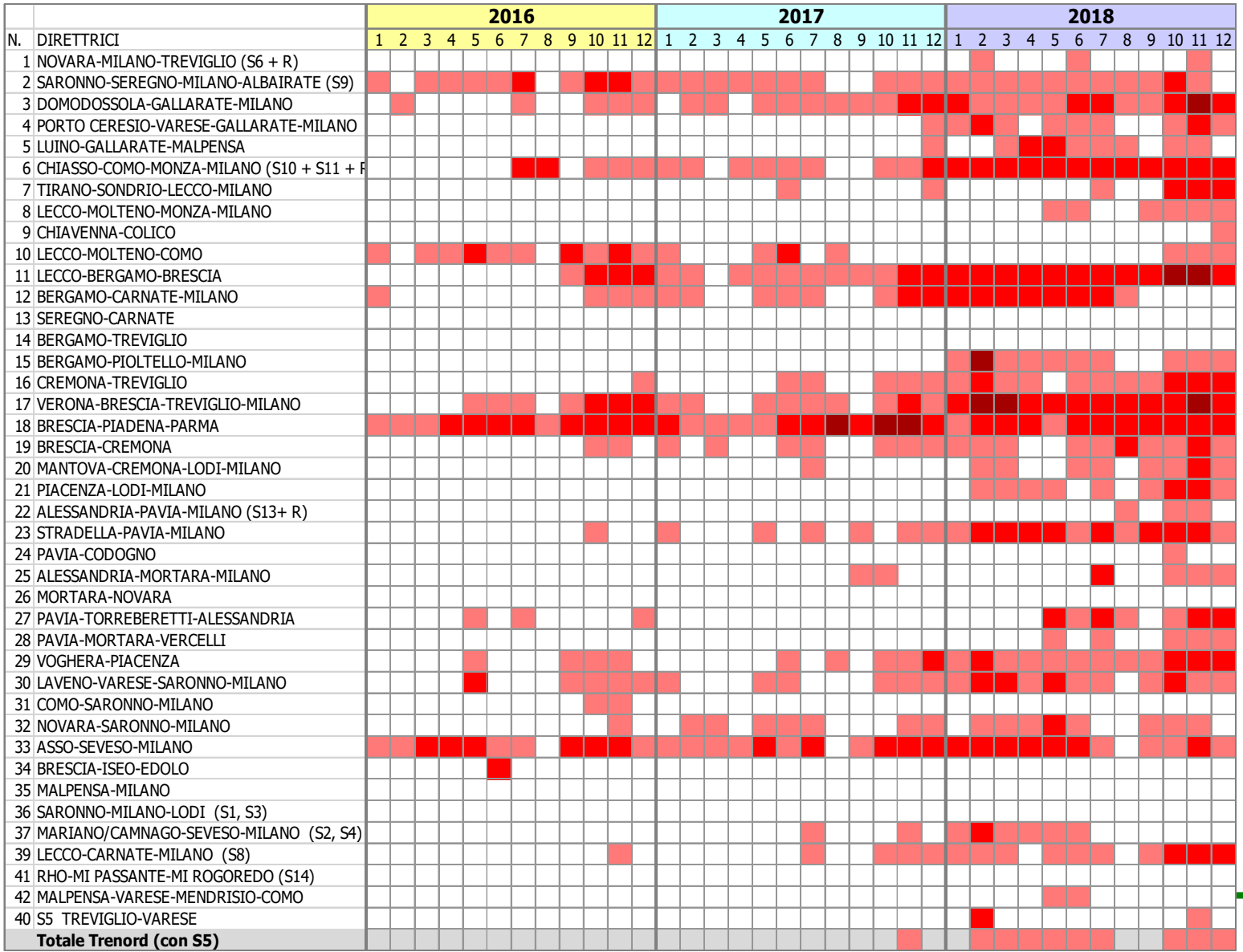
3) **30 diesel trains "Colleoni"** by Stadler.

New trains are bought by **Ferrovienord** (the regional network manager) and given to the operator (presently Trenord) with no charge.
This solution guarantee that there are not *access barriers* even if in the future the railway service will be assigned with a tender.

The Ingredients: Quality of the Operator

Puntuality reveals the health of a railway service

Red cells show low level of punctuality among rail lines in Lombardy. Between 2016 and 2018 **the punctuality falls down along most lines**, showing a strong crisis in the railway operator.



With **such a low quality**, every other theme becomes less important, and railway is going to become a **failure**.

Percentage of trains on time at the arrival station.

Legenda indice di puntualità	
Sopra 80%	
Tra 70 e 80%	
Tra 50 e 70%	
Sotto 50%	

The Ingredients: Travelling Quality

Quality of life: the stations

A traditional station in San Sebastiano Po (Piemonte).

The town square is a natural link between railway and city.

A station along Milano-Mortara line, rebuilt when the second track was added (2009).

Now the link between railway and city is... a wall 5 meters tall.

Quality of life: train interiors

Innotrans 2022 in Berlin: the most important European fair in public transport

Seats and windows are designed with no relation to each other: this is the result.
Where are the quality and the pleasure of travelling?

In Frecciarossa 1000 (*"the most beautiful train in the world"*, Trenitalia said), this is the only place where a child can sleep in his stroller. Near to the door, with no air conditioning (real life experience in 2016).

Quality of life: train interiors

Innotrans 2022 in Berlin

There are lots of ways **to make a train interior more pleasant** for passengers.

These examples come from a German suburban train.

Seats with unconventional arrangements, areas for standing passengers, tables for portable computers...

Of course these solutions **reduce the passengers/meters ratio**, but trains come from an history where this ratio was not so important (as it is for airplanes).

Waste without wisdom: just an example

Castagnole delle Lanze (AT), 8/2013 - Giorgio Stagni

Saluzzo (CN), 9/2013 - Giorgio Stagni

OLD LABEL **New label**

19 labels and signs in a small station (Saluzzo, Piemonte).

The new label appeared in 2012, and few weeks later the line was closed for "low traffic".

Every station in Piemonte **with only one track** has the number "1" on the platform.

Nucetto (CN), 28/4/2012 - Giorgio Stagni

New Infrastructures and Timetable Planning

New Infrastructures and Timetable Planning

A matter of planning:

1. ADVANCED

Before building the infrastructure, you exactly decide which kind of services will use the new rail, check if the timetable will work, write an agreement that is signed by all stakeholders (railway operators, public authorities,...).

2. MEDIUM

When you decide to build the infrastructure, you try to guess which kind of services will use the new rail, and hope the tracks and junctions will be enough.

3. BASIC

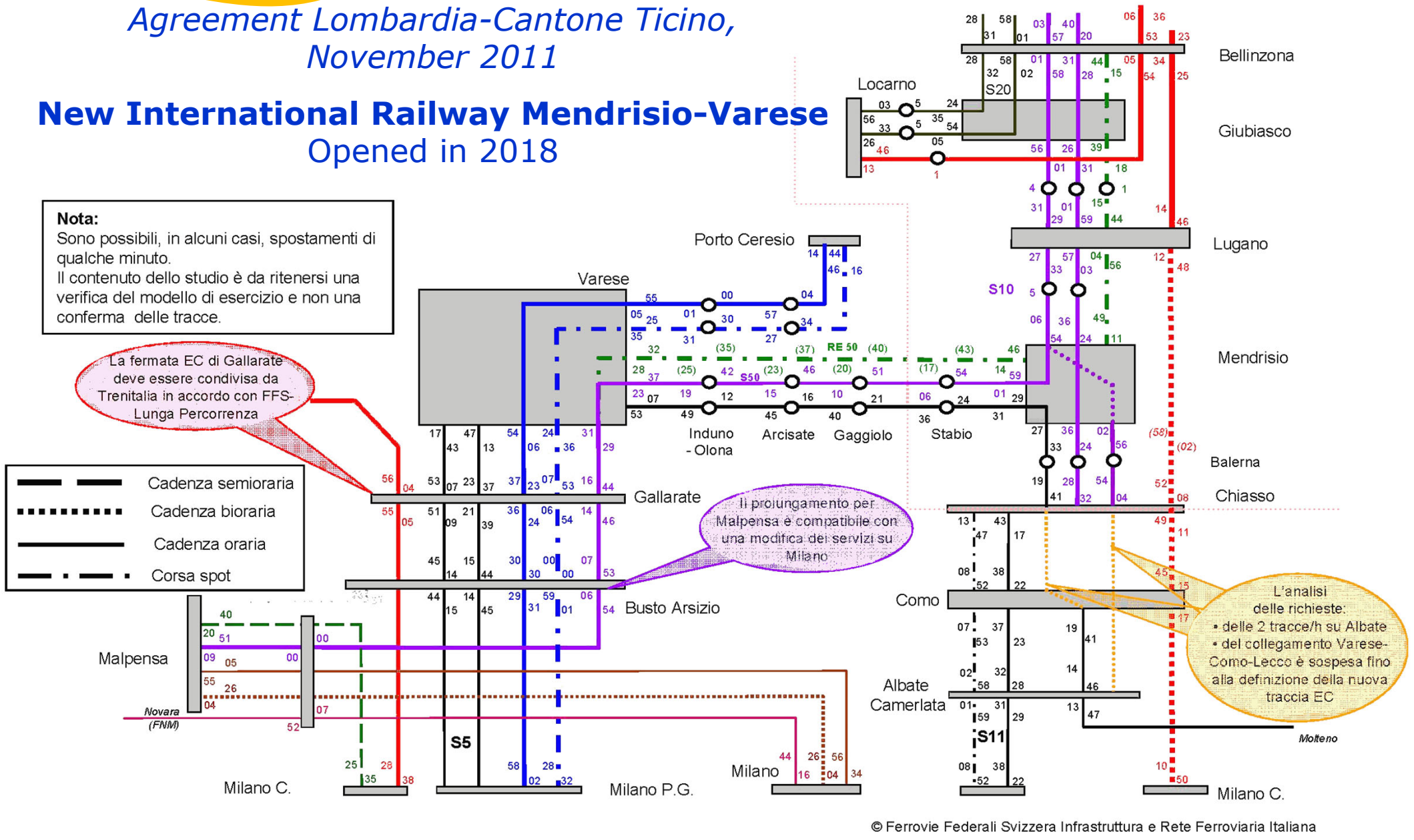
When you have decided to build the infrastructure, you make a press release that says: people will go from A to B in one hour instead of one hour and a half.

New Railway Mendrisio-Varese (CH-IT)

1. ADVANCED

Agreement Lombardia-Cantone Ticino, November 2011

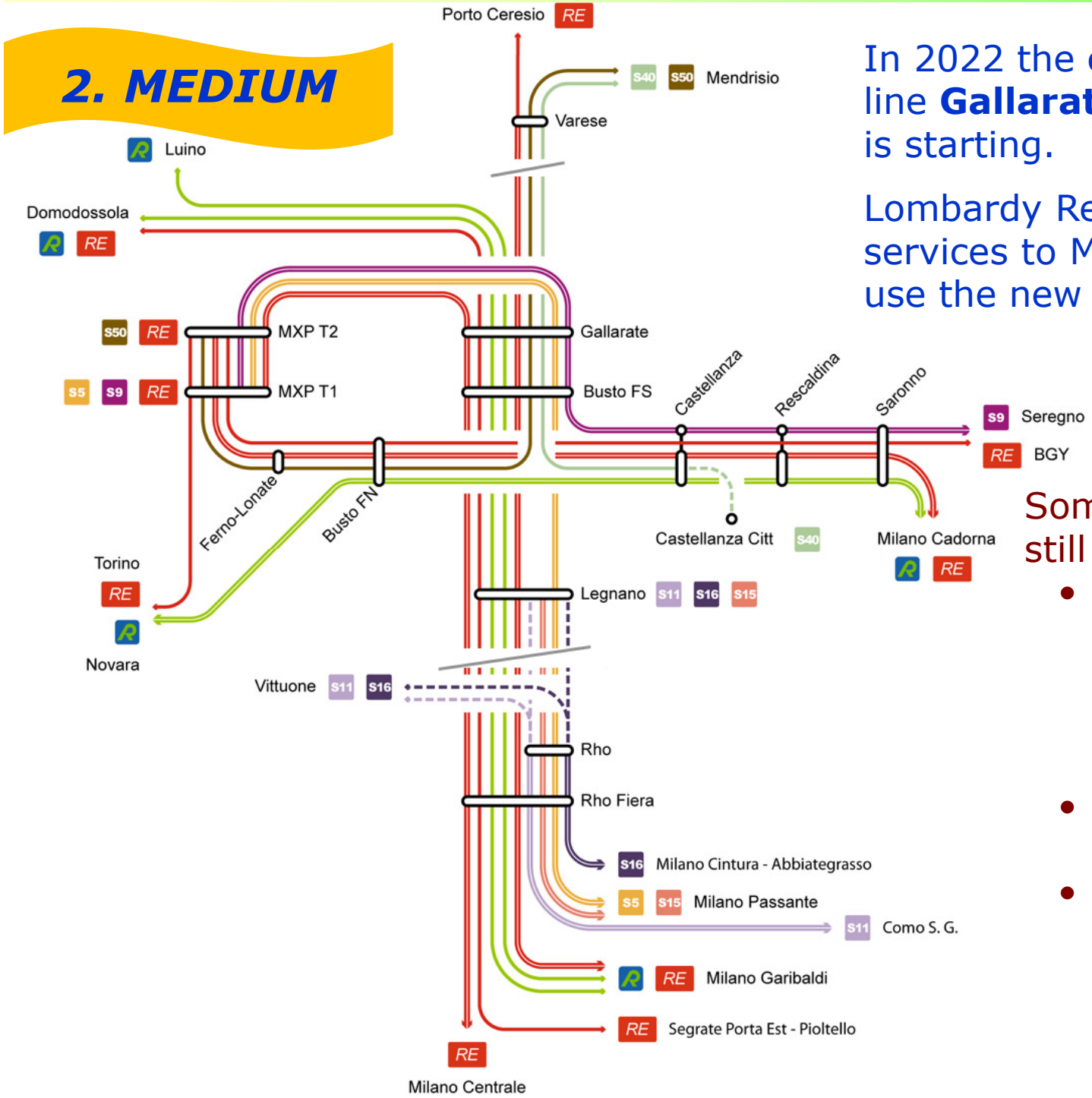
New International Railway Mendrisio-Varese
Opened in 2018



All rail services are planned with the exact timetable

New Railway Gallarate-Malpensa Airport

2. MEDIUM



In 2022 the construction of the new line **Gallarate-Malpensa Terminal 2** is starting.

Lombardy Region plans the future services to Malpensa Airport that will use the new line.

Some important questions are still without answer:

- which service will replace Malpensa Express in order to connect Milano Centrale to Ferrovienord network
- are there enough tracks in T1 and T2 stations
- when the 4 tracks between Rho and Parabiago will be available

New "Terzo Valico" tunnel Genova-Milan

3. BASIC

In 2013 a **27 km-long new tunnel** under Appennini mountains was started, in order to build a third line ("Terzo Valico") between Genova and Milan/Turin.

The opening of the new line is foreseen in 2025 (optimistic).

It's not a joke!

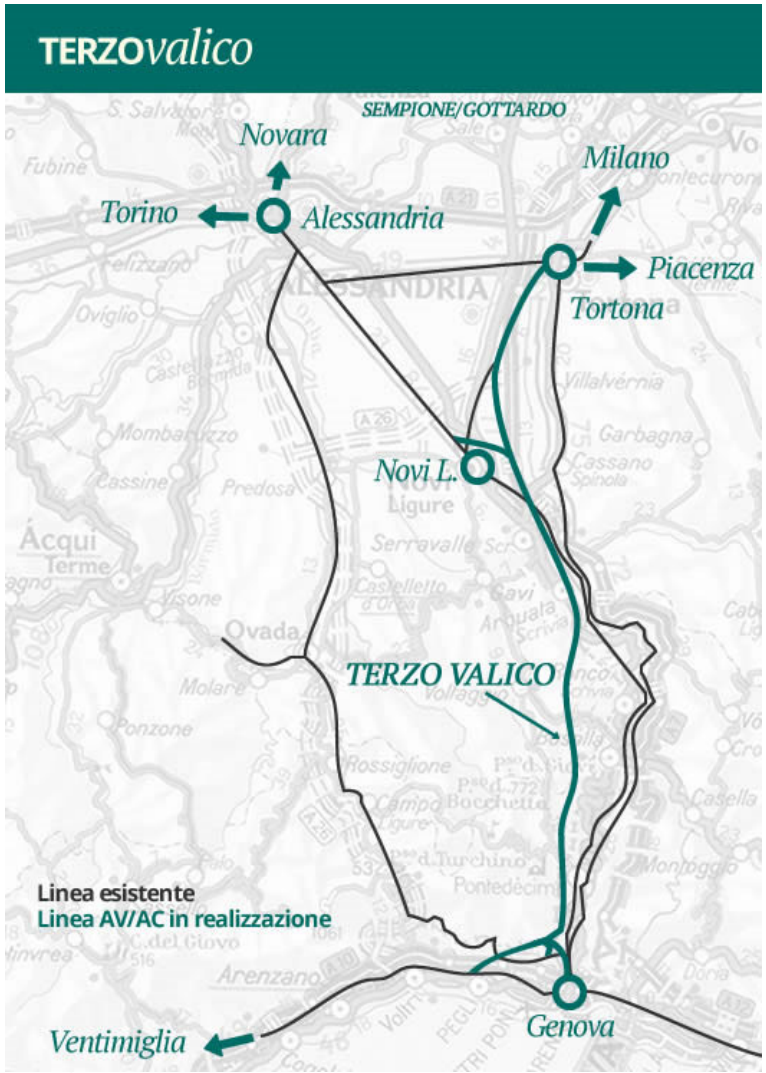
Really, there is nothing else!

***7 billions euros**, and no one knows how the tunnel will be used.*

By the way, the travelling time of 1 hour between Milan and Genova is not realistic.

New "Terzo Valico" tunnel Genova-Milan

3. BASIC



This is the only map available on official site www.terzovalico.it.

The new line is painted over a vintage Touring Club map dated 1975!

All questions remain with no answer:

- which services will use the new line
- which is the reduction in travelling time
- are the junctions in Tortona and Genova able to manage the new traffic
- are the Regional governments willing to pay for regional services that can use the additional capacity available on the old line

New infrastructures without planning the service

What we have seen with Terzo Valico is the **standard situation** for **all new infrastructures** that are planned or are under construction, both for long distant and regional traffic.

Some examples:

- second track Piadena-Mantova (Lombardy)
- second track Finale-Andora (Liguria, the last section still with single track)
- new High Speed line Brescia-Verona-Vicenza
- four tracks between Voghera and Tortona

In many other cases investments are made without an idea of **what they will offer to the passengers**. The most typical situation is **electrification** of diesel lines.

An example: Alba-Bra (Piemonte), electrified in 2016; exactly the same number of trains, exactly the same travelling time Alba-Torino (before, with 1 train change; after, with no change).

Electrification is a classic "green washing": no social conflict, easy to do, easy way to spend public money, easy promise of a "better future".

What can we say, at last?

- Improving public transport always **requires additional public money,** because new service needs stable subsidy to work.
- A system using public subsidy must be efficient; in public transport it means that **it has to carry a lot of passengers.**
- Public funds must be used to increase the efficiency of public transport, that is **increase passengers**.
- Number of trips, **frequency**, **travelling time**, efficient connection among different lines and a good **fare system** are the main instruments to increase success in public transport.
- Also investments (new infrastructures and trains) are useful, but we must "guess" them, i.e. we must **select only investments** that go into the direction of the service we want. And we must sign an agreement before the infrastructure is built.
- There is a new problem of **intrinsic quality** of trains, stations and relationship with urban planning.

Learning more:

www.stagniweb.it

Thank you for your kind attention and... **have a nice trip!**