Organisation of Rail Transport: A Case Study in Lombardy

Lesson 1. Railway Managing in Lombardy

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  - Our Tools: Timetables and Charts

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  - People on Trains: Some Examples

Railway: Subjects and Contracts

Railways: Subjects Involved

Network managers

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

RFI

Holding

FS

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)

Ferrovienord

- Same as RFI, plus buying trains

FNM

Trenord *

Regional and suburban trains in Lombardy

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

Railways: Contracts and Payments

Network managers *Holding* *Railway operators*

Other regions Service contracts

Access charge (access contract)

RFI FS **Trenitalia** Regional

Freight

Long Distance

Contract for infrastructure

Train leasing

Italian State

Access charge

Service contract

Trenord

Train leasing Train leasing

Ferrovienord FNM

Service contract for network⇒ *subsidy*

Contract for infrastructure

Lombardy Region

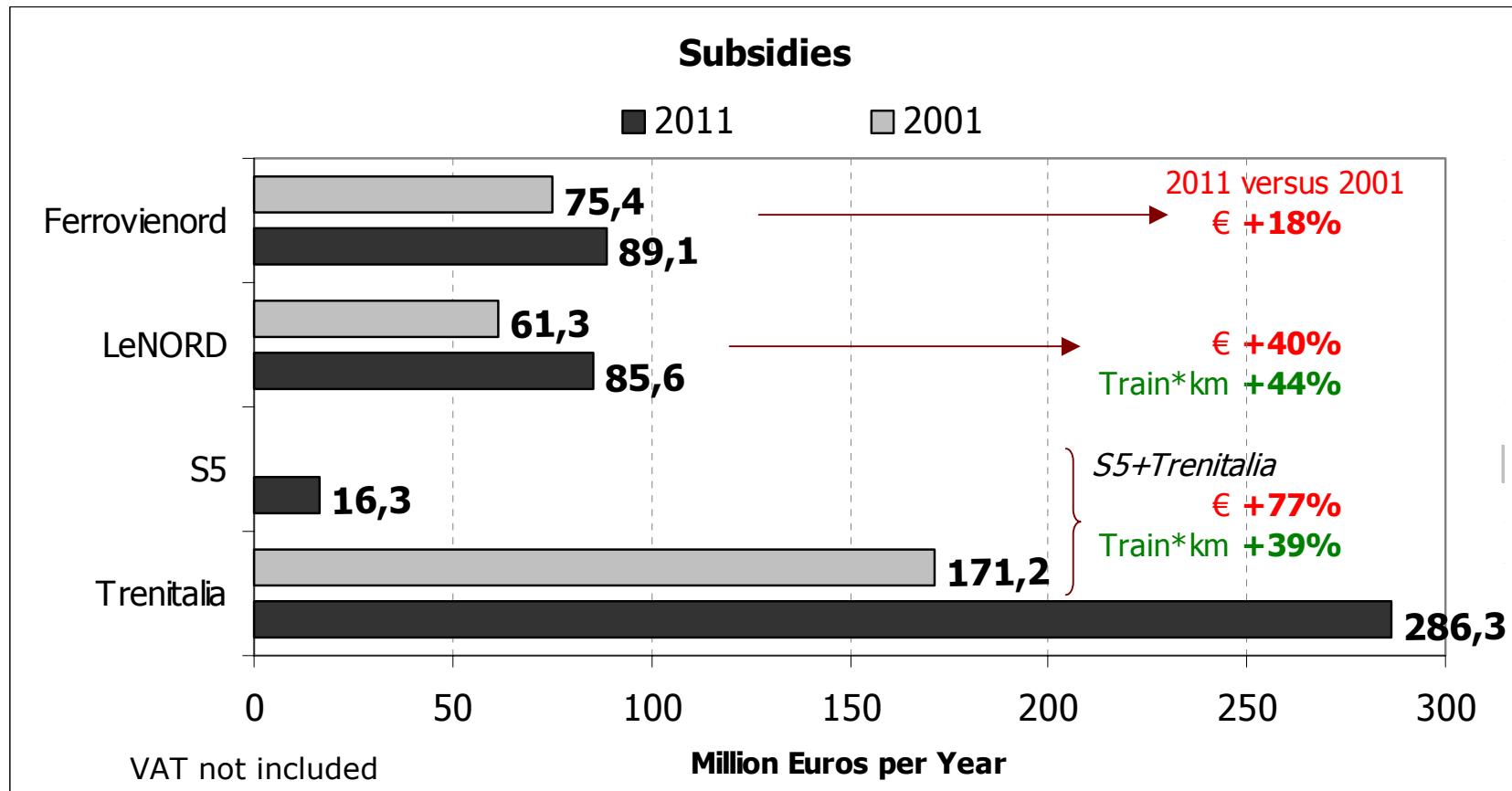Service contract ⇒ *subsidy*

Regional Railways System in Lombardy

- **1.920 km** of railway network
  400+ railway stations

- **2200+ trains per day**
  along 37 lines

- **36,7 million** trains*km per year
  (16% of Italian regional traffic,
  +32% since 2001)

- **600.000 passengers** per day

- **3 service contracts:**
  LeNORD & Trenitalia (now
  Trenord),
  Line S5 (tendered in 2004)

FS-RFI:

— Long distance & regional

----- High Speed

— Regional

Ferrovienord:

—
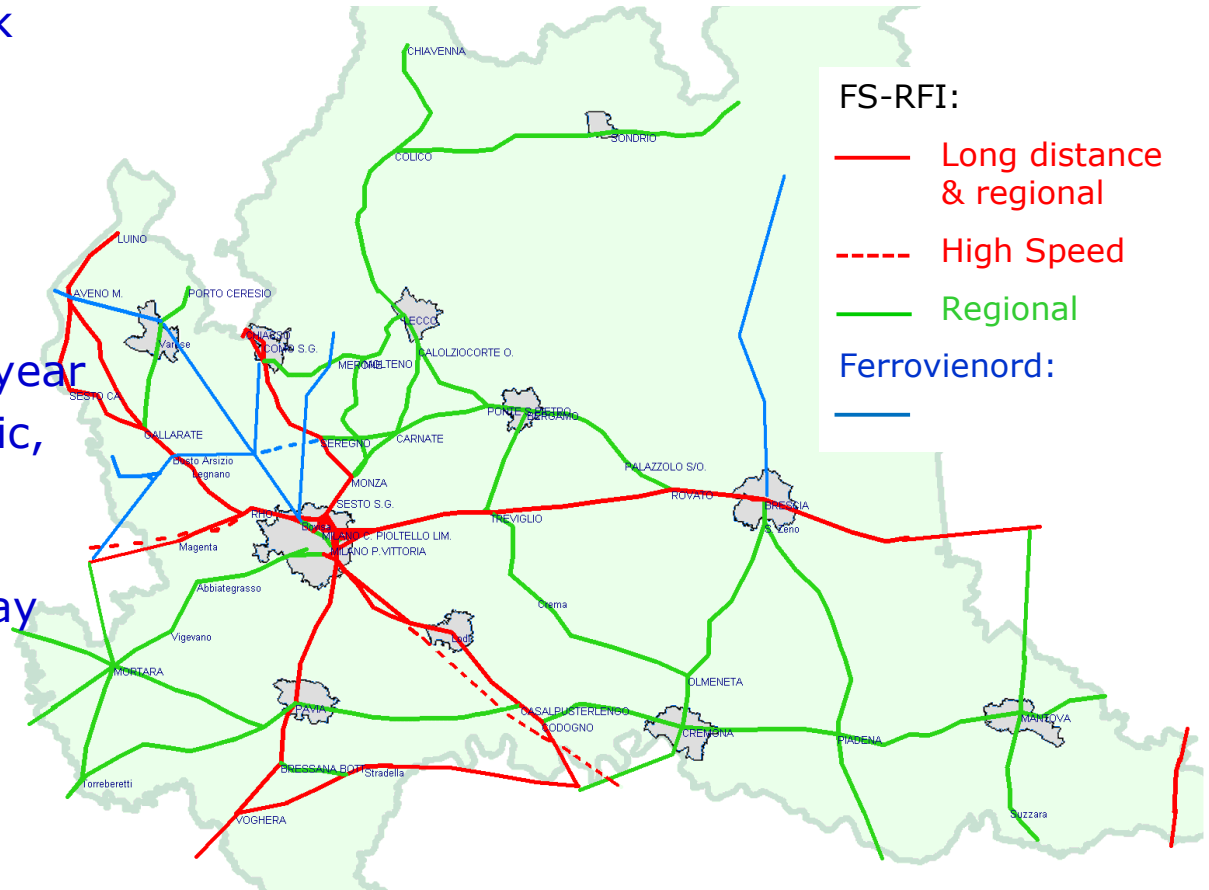
Money Figures (Subsidies)

- 4 contracts, **308** M€/year in 2001, **477** in 2011.

Subsidies

■ 2011   □ 2001

Ferrovienord: 75,4 (2001), 89,1 (2011)
LeNORD: 61,3 (2001), 85,6 (2011)
S5: 16,3 (2011)
Trenitalia: 171,2 (2001), 286,3 (2011)

2011 versus 2001
€ **+18%**

€ **+40%**
Train*km **+44%**

S5+Trenitalia
€ **+77%**
Train*km **+39%**

VAT not included

Million Euros per Year

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

❑ **Frequency**
for short distance trips

❑ **Speed**
for medium distance trips

❑ **Offering a system of services**
not only single trips:

  ❑ coordinated timetables

  ❑ coordinated information

  ❑ unique fare system

➡ Public transport is truly effective *if:*

- it is available during the whole day

- it reaches every place

  (with a sequence of connected services, when necessary)

A Structured and Ordered System...
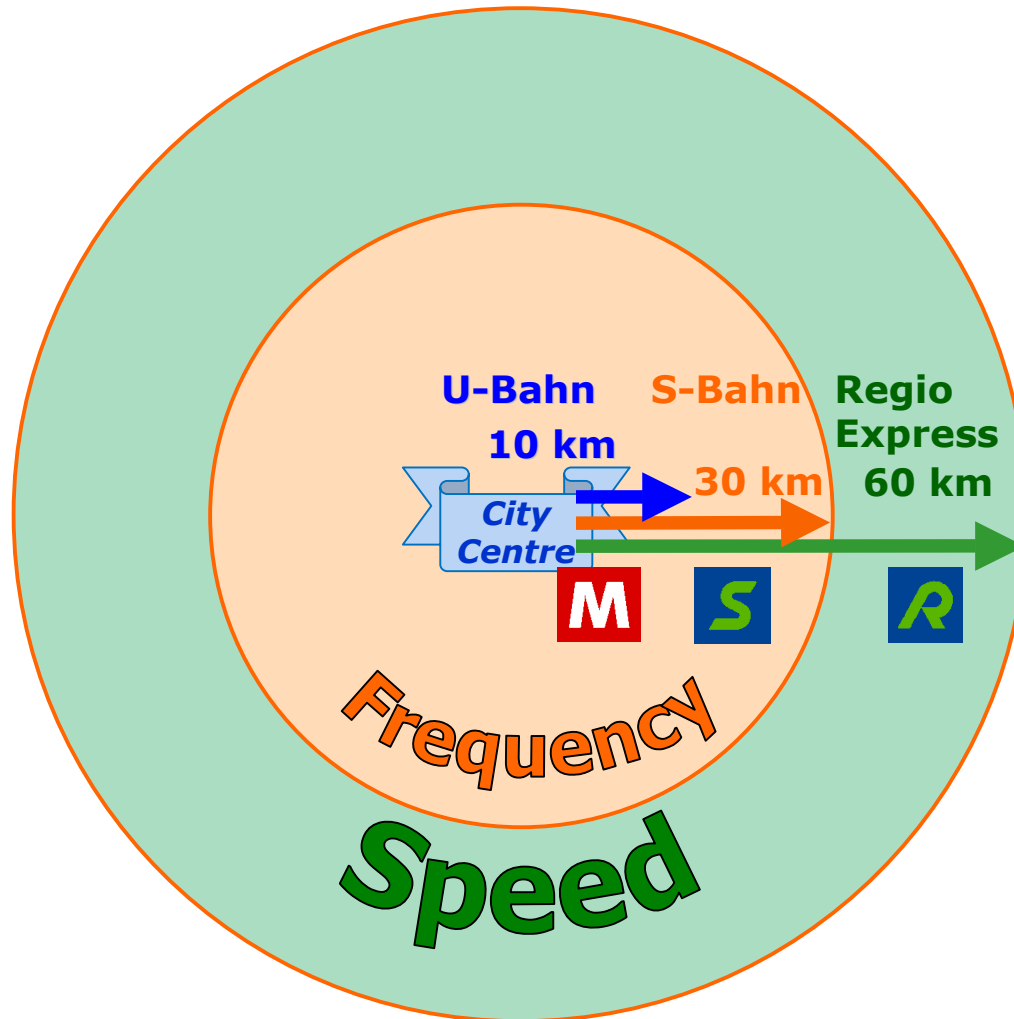
A structured and ordered system...

...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)*
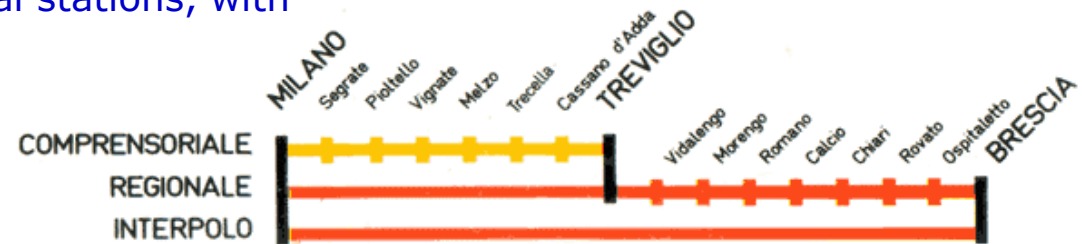
…Coming from Our Past

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!)

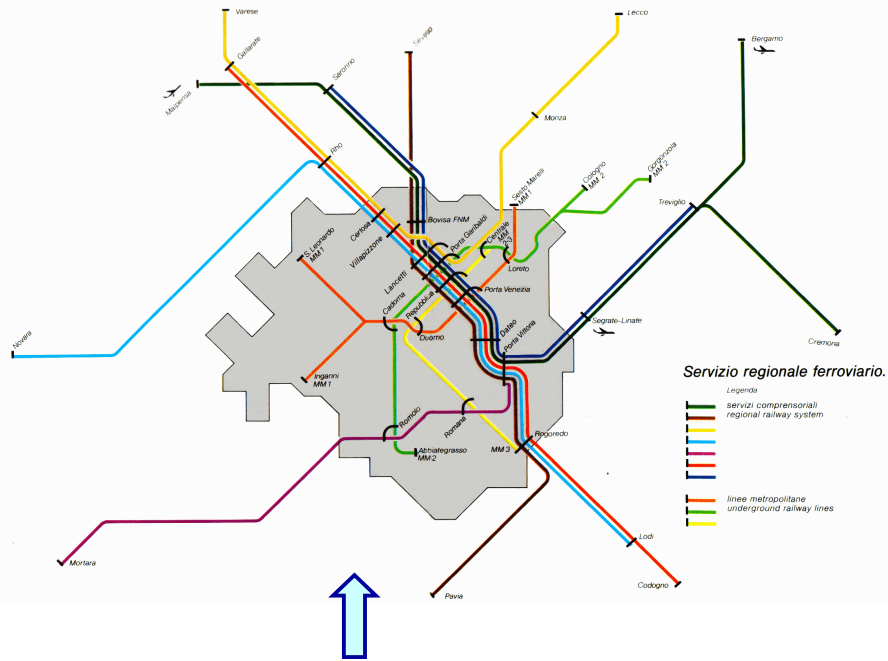The Master Plan already defined a hierarchy of railway services for regional connections:

- **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 RegioExpress), 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 CityExpress), to connect main regional stations, with few intermediate stops.

il servizio ferroviario regionale

TRASPORTI REGIONE LOMBARDIA

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

MILANO · Segrate · Pioltello · Vignate · Melzo · Trecella · Cassano d'Adda · TREVIGLIO · Vidalengo · Morengo · Romano · Calcio · Chiari · Rovato · Ospitaletto · BRESCIA

COMPRENSORIALE
REGIONALE
INTERPOLO

2011: the final network

1986: planning the system

Servizio regionale ferroviario.

Between the two maps:
25 years.

Why?

Servizio Ferroviario Suburbano

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*

2007-2011: **99 new trains**

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

Hardware.

2004-2011: the new suburban service (**S Lines**) appears

Software.

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.

Our Software: an Ordered Timetable

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

Timetables in Lombardy have been designed **"in an ordered way"**:

→ trains arrive and leave *hub stations* in such a way to **maximise the number of connections;**

→ as the frequency is constant, the same connections are available along the whole day, **every hour or every 30 minutes**.

→ as the timetable is **symmetric**, the connection works in both directions and with the same changing time

Timetables are also **"structured"**:

→ as it was planned since 1982 Master Plan, each train "does its own job": *slow/fast, short trip/long trip*

→ **route**, number of **stops**, **speed** and **frequency** are not random values but are selected when designing the system and are connected to each other

S-Bahn & Regional Lines in Lombardy

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**
- a **simple and unique fare** for the whole regional system

- **First S-Lines running since December 2004**
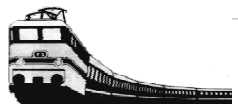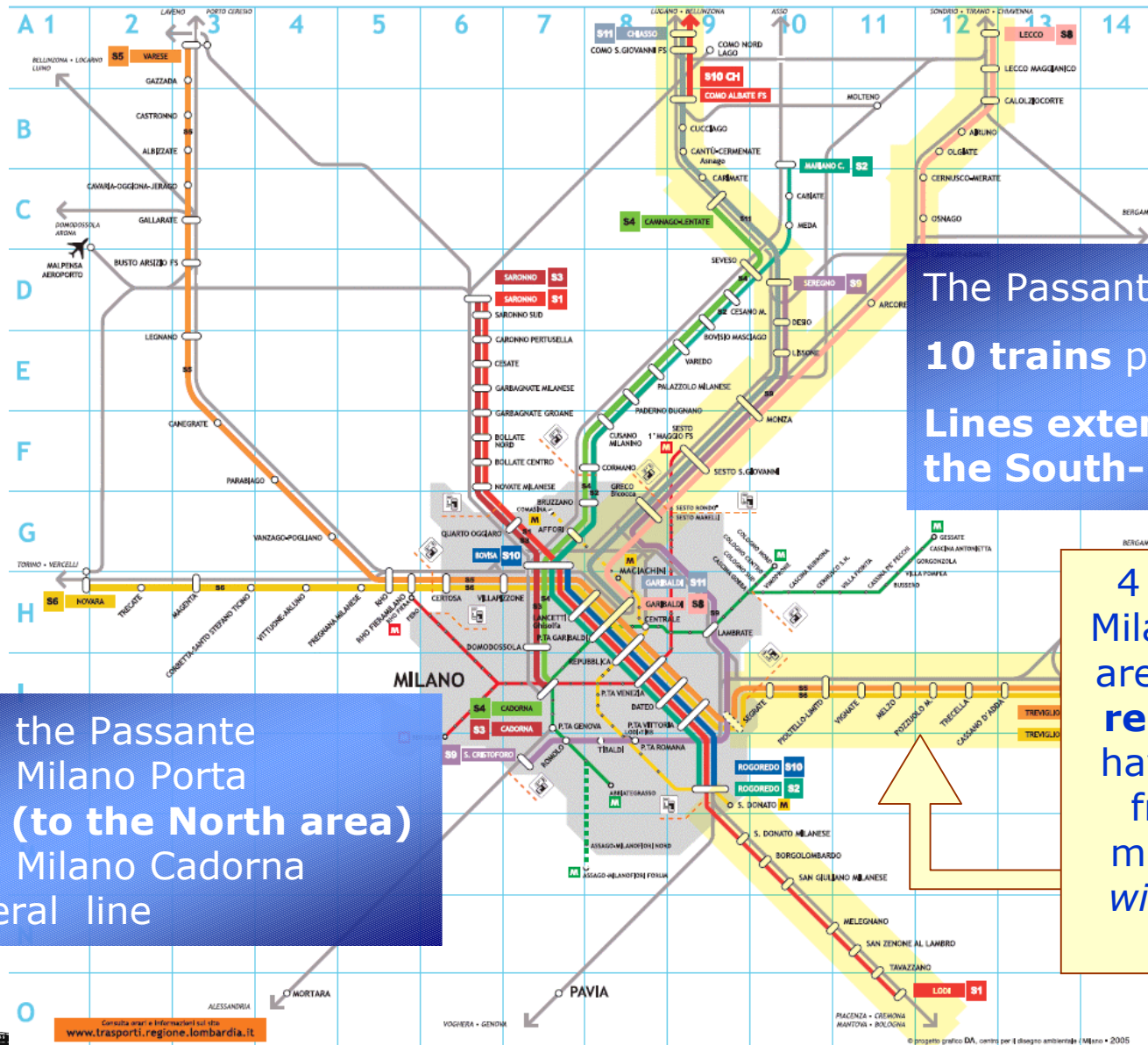- **With S13 to Pavia starting in December 2011 the S network is almost completed!**
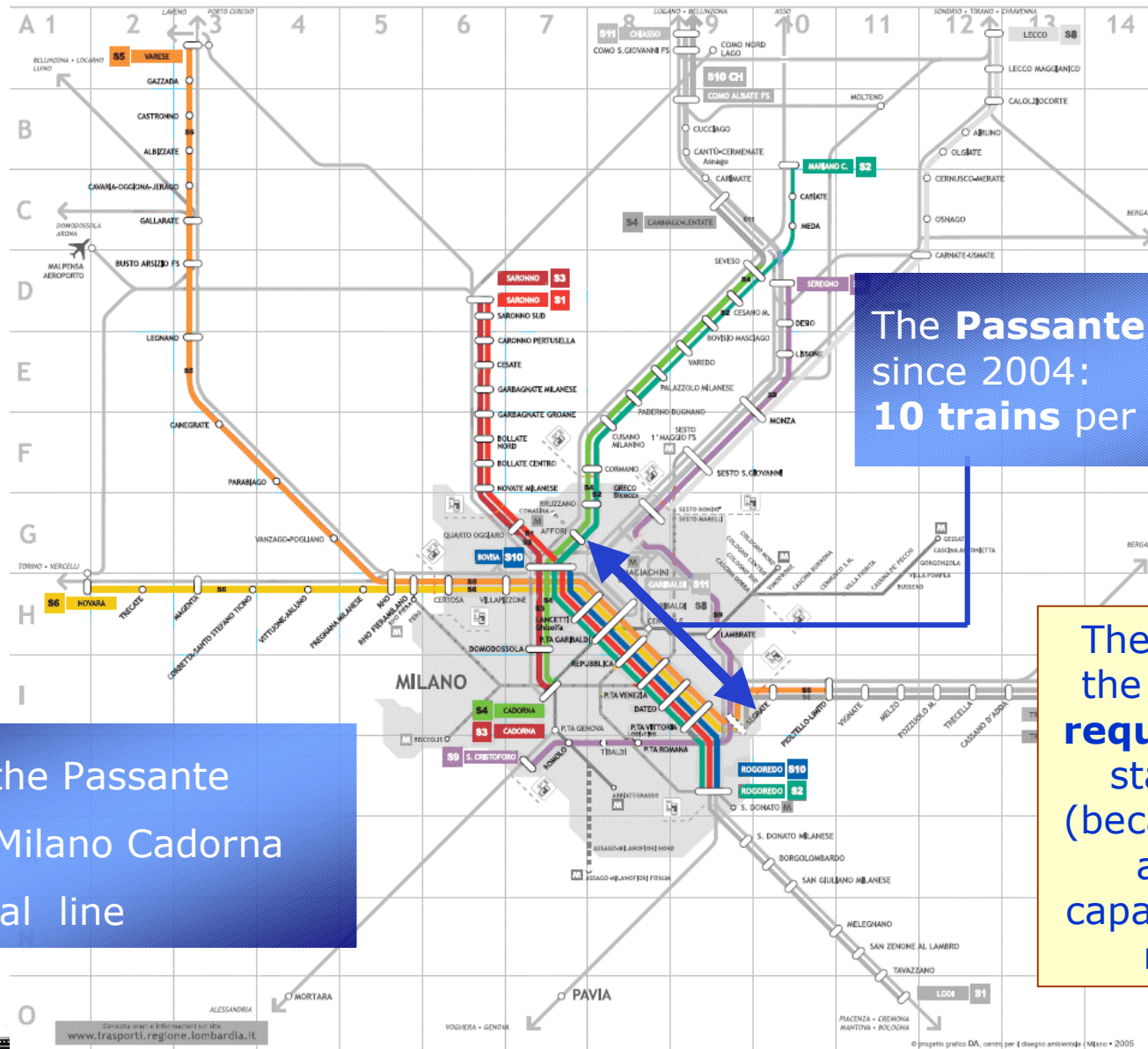
The **Passante** of Milan since 2004:
10 trains per hour-direction

The Passante is the "**hardware requirement**" to start S Lines (because it offers additional capacity in urban network)

5 lines in the Passante

**2** lines to Milano Cadorna

1 peripheral line

The Passante of Milan:

10 trains per hour-direction

Lines extended towards the South-East areas

4 tracks between Milano and Treviglio are the "**hardware requirements**" to have S lines with a frequency of 15 minutes, *together with long distance traffic*

5 lines in the Passante
2 lines in Milano Porta Garibaldi **(to the North area)**
2 lines in Milano Cadorna
1 peripheral line
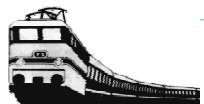
The Final S-Bahn System

S1   **Saronno – Mi Passante – Lodi**

S2   **Mariano C. – Mi Passante**

S3   **Saronno – Mi Cadorna**

S4   **Camnago – Mi Cadorna**

S5   **Varese – Mi Passante – Treviglio**

S6   **Novara – Mi Passante – Treviglio**

S7   **Lecco – Besana – Monza – Mi Garibaldi** (to be introduced)

S8   **Lecco – Carnate – Monza – Mi Garibaldi**

S9   **Albairate – Milano – Monza – Seregno – Saronno**

S10   *Albate – Chiasso – Bellinzona – Biasca* 🇨🇭

S11   **Chiasso – Monza – Mi Garibaldi**

S12   **Varedo – Mi Passante - Melegnano** (to be introduced)

S13   **Mi Passante – Pavia** (since December 2011)

R-Lines… an Added Value for the Whole Region

❑ **improved network** around Milan (2 & 4 tracks instead of 1 or 2)

❑ **the S-Bahn system** now travelling along the the suburban stations

No need to stop in intermediate "S" stations for regional services.

This permits a new design also for regional trains, in order to obtain **faster connections for the whole Region**

→ **Regio Express**: for faster connections of peripheral areas towards Milan

es. Brescia-Treviglio with stops and then non stop to Milan; Varese-Saronno and then non stop to Milan, etc.

→ **City Express**: for fast connections among main cities

from Milan to **Lecco-Sondrio**, **Cremona-Mantova**, **Bergamo**, **Brescia-Verona**, **Varese**, **Como**

City Express trains are the true "valuable services", and the way to avoid that regional transport is transformed into simple "commuters transport"!

Describing the Service: Easy and Understandable

From the presentation that Regione Lombardia prepared and customised *for each Municipality* when the new timetable was introduced in **December 2009**.

As the suburban service is introduced, in **Melzo** there are:

> **an S5 train every 30 minutes**,
>> - from early morning to midnight,
>> - everyday during the week
>
> <u>and in peak hours</u> **a train every 15 minutes** (as the sum of S5 and S6 lines)

along all stations between Treviglio – Mi Passante – Rho, towards Varese/Novara

☺**Easy to remember timetable**

> From **Melzo** to Milan, train leave at minutes: **57 - 12$^+$ - 27 - 42$^+$**
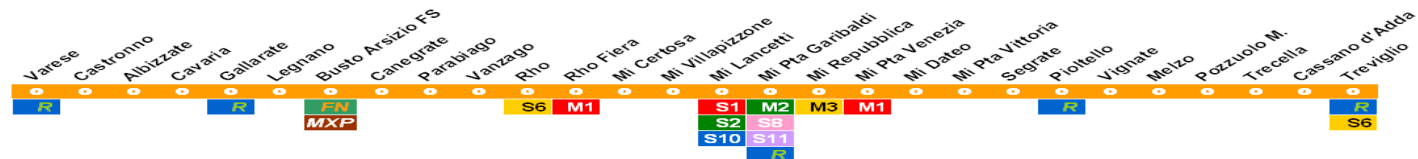>
> *Example:* 7.57 – 8.12 – 8.27 – 8.42   *(+ peak hours only)*

☺All trains stop in **all stations**

☺Trains run at same frequency towards Treviglio and Milano

S5
Varese
Gallarate
Milano
Treviglio

Varese – Castronno – Albizzate – Cavaria – Gallarate – Legnano – Busto Arsizio FS – Canegrate – Parabiago – Vanzago – Rho – Rho Fiera – Mi Certosa – Mi Villapizzone – Mi Lancetti – Mi Pta Garibaldi – Mi Repubblica – Mi Pta Venezia – Mi Dateo – Mi Pta Vittoria – Segrate – Pioltello – Vignate – Melzo – Pozzuolo M. – Trecella – Cassano d'Adda – Treviglio

If I can describe the service easily, it means that it is well designed.
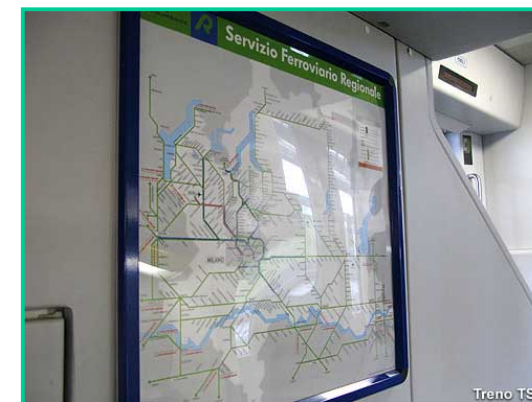
Identifying the Service at First Sight:

← **In the stations**

On trains →

"In such a way, I go everywhere" everyday

Learning more:

www.miol.it/stagniweb

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