Index

- Freight Village – Definition
- Interporto of Bologna

Interporto Bologna SpA

WHAT IS A FV

A Freight Village is a defined area where all the activities relating to transport, logistics and distribution of goods, both for national and international transit, are carried out by different operators

The **FREIGHT VILLAGES** are transport realities that could offer the required infrastructures to support the:

Territorial planning
Rationalization of the infrastructures
Transport quality
Intermodality development

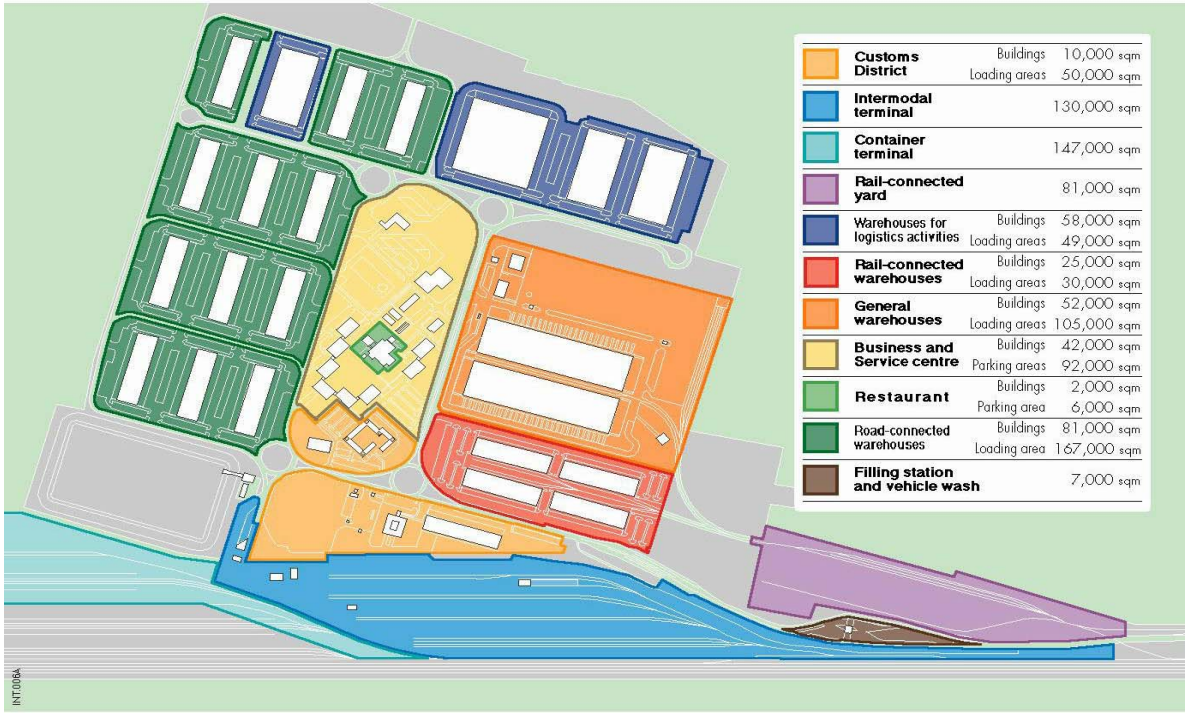
Interporto Bologna SpA

INTERPORTO BOLOGNA SPA

Interporto Bologna SpA

WHO WE ARE

The Bologna freight village is an integrated system of infrastructures aimed at carrying out all transport and intermodal activities



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INFRASTRUCTURES

Total Surface 4.270.000 sqm

- Warehouses with raised docking bays
- Warehouses with rail-road interchange
- Large-sized warehouses
- Public warehouses for storage
- Intermodal terminals

SERVICES

- Customs District
- Post Office/Public telephones/Bus service/
- Restaurant/Banks
- Areas for parking and loading/unloading operations
- Filling station with vehicle washing facilities

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FIGURES

Road Transport	2.200.000 TONN
Rail Transport	1.900.000 TONN

n° Lorries	930.000
n° Trains	7.000
n° **Transport & Logistic Companies**	**100**
n° Employees	1.500

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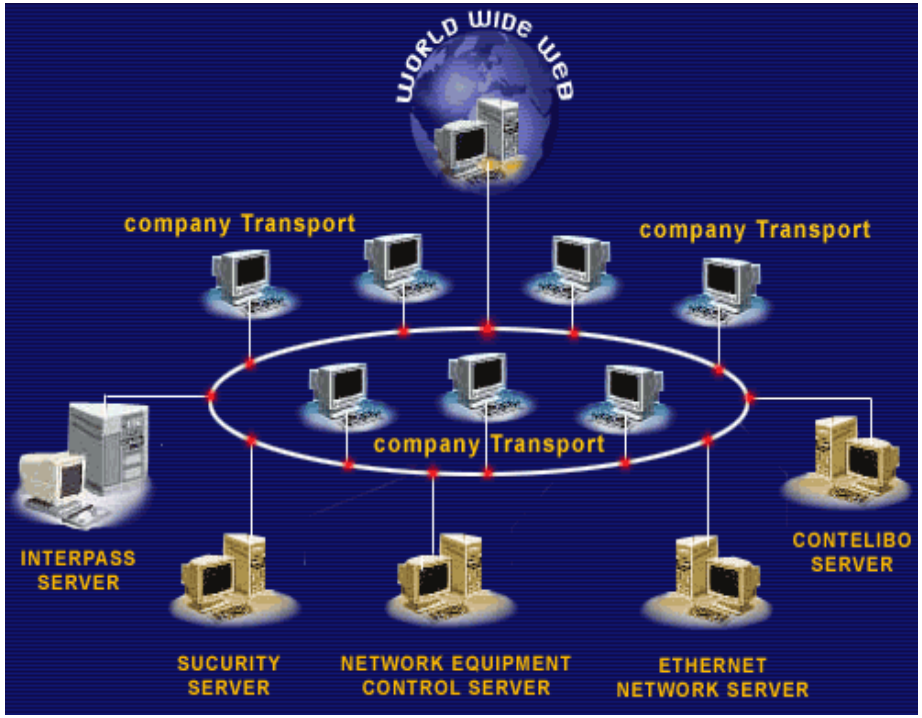
TELEMATIC NETWORK



- Data transmittal
- Access to the economic data banks present in the market
- Information services supplied by the Public Administration
- E-mail services
- Centralization of security, burglary, fire services, etc.
- Exit control of heavy cargo vehicles with the "**Interpass**" service.

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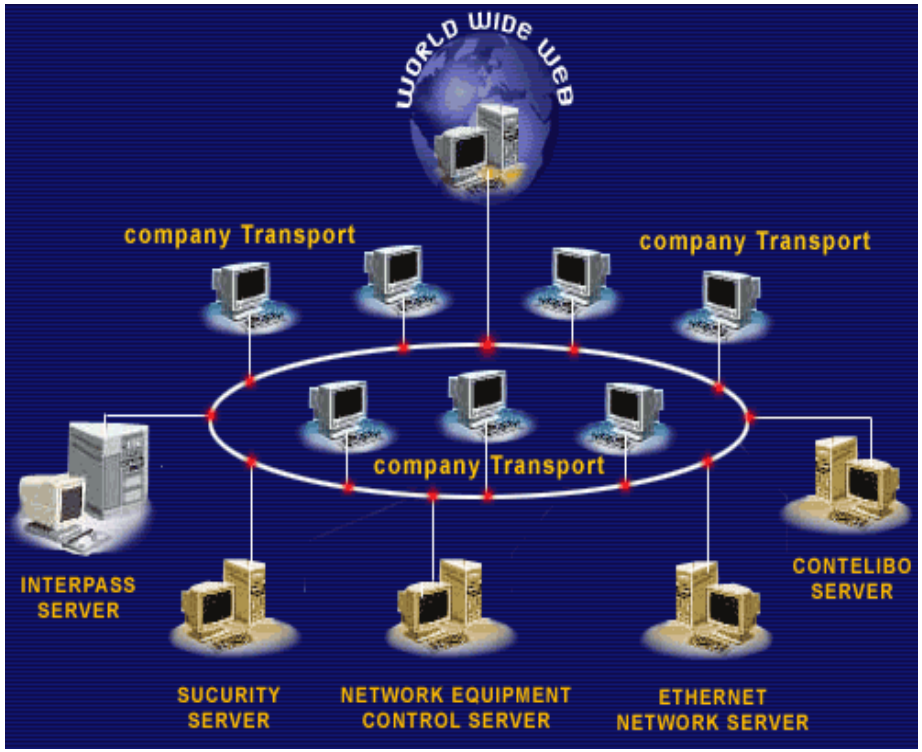
TELEMATIC NETWORK



- Km fibre optic: 7
  - Km power line: 3
  - N° of power supply units: 28
  - N° of generators: 2 (total power 100 kw)
  - N° of servers: 12
  - N° of Pc linked to the net: 100
  - Speedy of nodes:100 Mbit as far the main 4 nodes, 10 Mbit as far the remaining nodes
- Type pf net. Ethernet 802.3.

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IT for Intermodal Terminal

Interporto Bologna Experience

Interporto Bologna SpA

Tracking
&
Tracing

TTI
project for Tracking and Tracing of goods

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TTI Project

Tracking & Tracing using Internet
- Pilot Project -

Ist Phase: Creating new web services to offer the companies/actors of Interporto

2nd Phase: Trying-out the RF-ID technology as far the supply-chain activities

The operators involved are all National Couriers:
Bellesia, Combitrans, Nieddu-Trail, Saves.

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TTI Project

Objectives

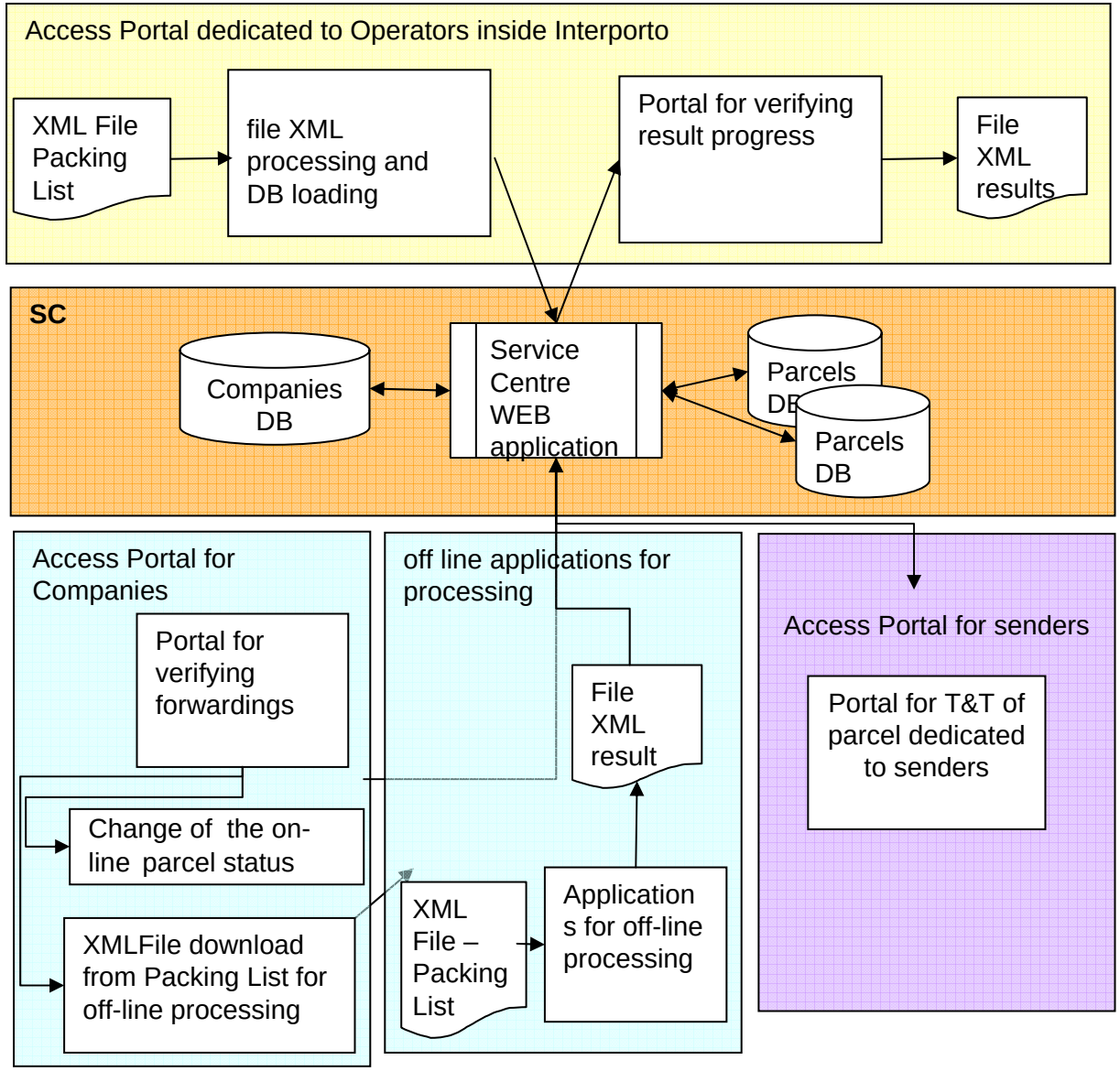
The TTI project aims at offering new tracking & tracing services, using internet, to operators inside Bologna Freight Village, to their affiliates and to end users .
The system has been conceived to trace goods by a Web Portal (WP) and to allow to modify the delivery status.

The WP web portal is only the visible ring of a longer list of services offered by a real Service Centre (SC). The SC offers a data / exchange service and allows the companies to:
- Send data concerning delivery status to SC using a xml standard format
- Collect a xml data exchange file containing the delivery result from SC .
- Offer affiliates the possibility to exchange and entry/modify the data (offering a on –line and off-line service mode);
- offer their clients the access to the delivery status;

The strenght of this system is that it can work without changing the existent IT System of companies involved using a data exchange standard.

TTI Development

System Framework



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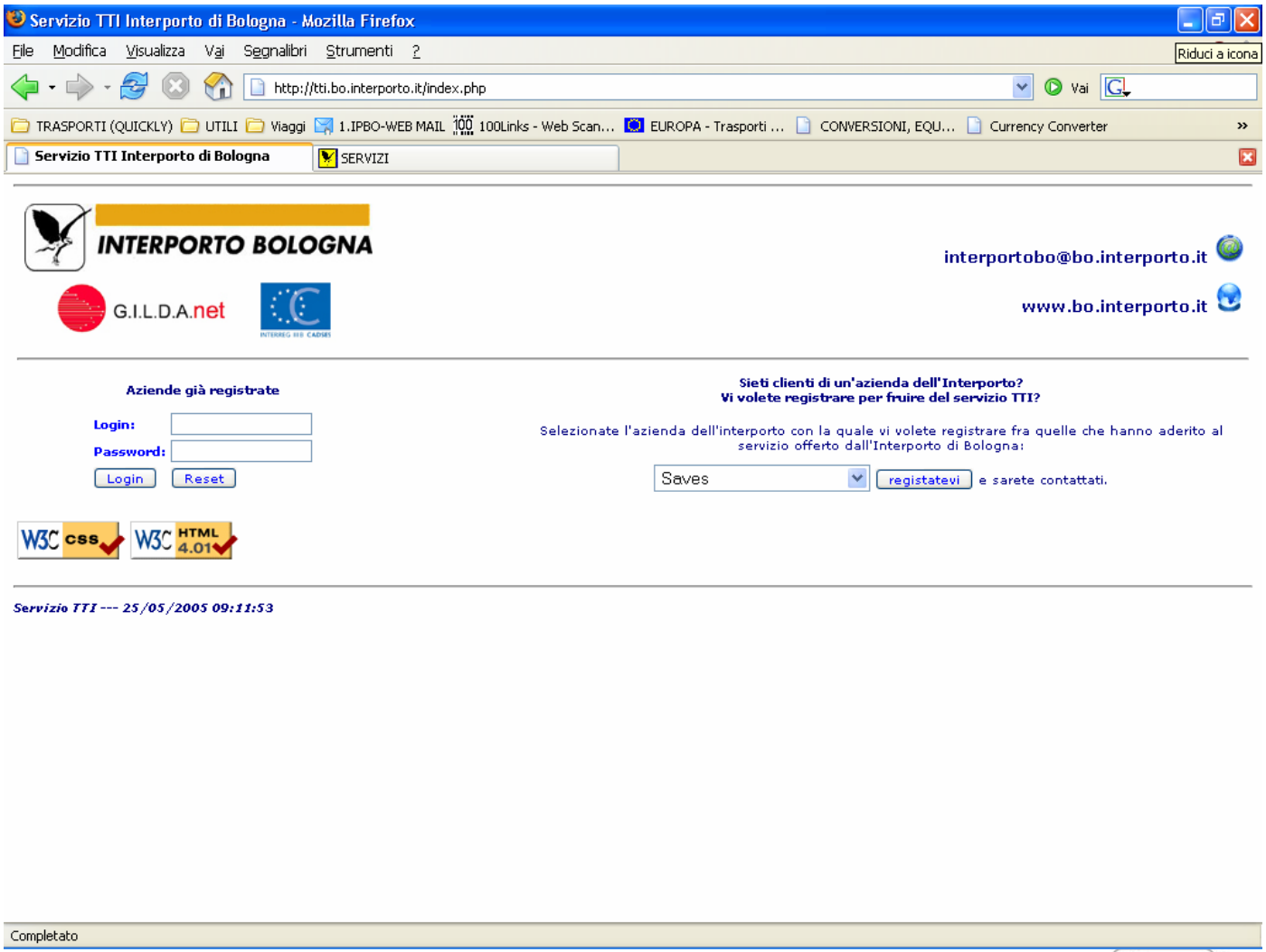
TTI Development



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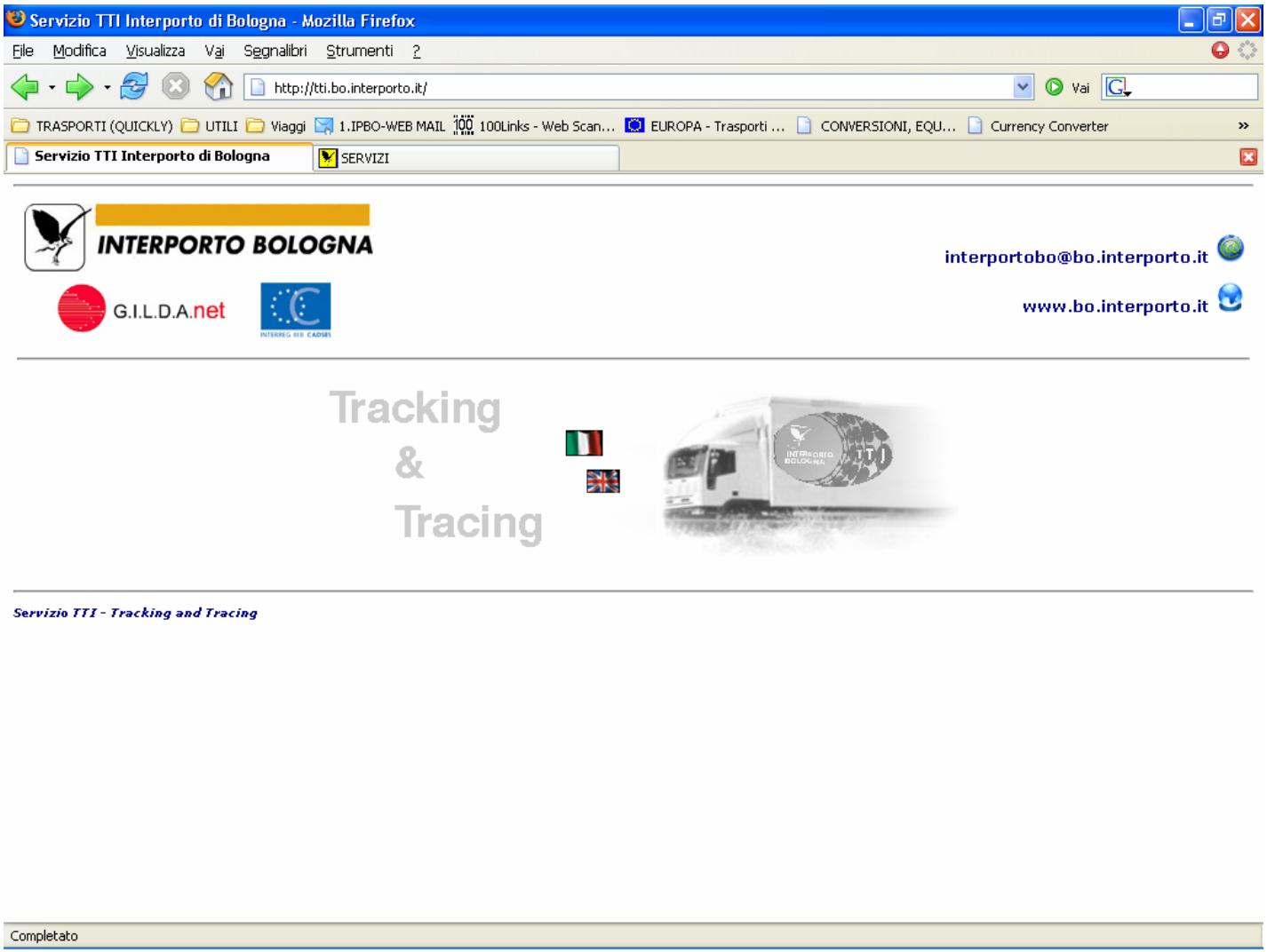
TTI Development



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TTI Development

INTERPORTO BOLOGNA

G.I.L.D.A.net

interportobo@bo.interporto.it

www.bo.interporto.it

Sezione Visualizzazione spedizioni per **TTI Administration user (admin)**

Esci | Menu | Indietro

Dal (GGMMAAAA) 11052005

Al (GGMMAAAA) 12052005

Numero di Risultati trovati: 1-20 su 750

Pagina Precedente --- **Pagina successiva** --- **Visualizza Tutte**

	Id	Azienda	Corrispondente	Mittente	Destinatario	Provincia	Numero bolla	Cerca / Ultimo esito
>	73083	SAVES	SAVES01500108	T.S.E C.TO BINNY SMITH	MINERVA 2000 SRL	FO1	01015054680 (11/05/2005)	Consegnato definitivamente (16/05/2005)
>	73084	SAVES	SAVES01500090	T.S.E C.TO BINNY SMITH	MOBILBIMBI	AN	01015054681 (11/05/2005)	Consegnato definitivamente (13/05/2005)
>	73085	SAVES	SAVES01500089	T.S.E C.TO BINNY SMITH	L'ALBERO DELLE MELE	MI	01015054683 (11/05/2005)	Consegnato definitivamente (17/05/2005)
>	73086	SAVES	MTN-PD	T.S.E C.TO BINNY SMITH	AUCHAN MESTRE	VE	01015054684 (11/05/2005)	Consegnato definitivamente (17/05/2005)
>	73087	SAVES	SAVES01500089	T.S.E C.TO BINNY SMITH	LIBRERIA MILANO	MI	01015054685 (11/05/2005)	Consegnato definitivamente (17/05/2005)
>	73088	SAVES	MTN-FI	T.S.E C.TO BINNY SMITH	MAGAZZINO ESSELUNGA	FI1	01015054686 (11/05/2005)	Consegnato definitivamente (17/05/2005)
>	73089	SAVES	MTN-PD	SAVES01001374	POLBIC INSTITUTE	VE1	01015054827 (11/05/2005)	Consegnato definitivamente (16/05/2005)

Completato

TTI Development

Servizio TTI Interporto di Bologna | SERVIZI

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Dettaglio bolla per **TTI Administration user (admin)**

Esci | Menu | Indietro

Azienda Interporto SAVES
Corrispondente MTN-PD

Dati Mittente		Dati Destinatario		Dati Bolla		Dettagli Spedizione	
Nome	T.S.E C.TO BINNY SMITH	Nome	AUCHAN MESTRE	Numero	01015054684	Numero Bancali	
Riferimenti	957 10-05-2005	Indirizzo	V DON TOSATTO 22	Data	11/05/2005 12:17:00	Peso	120
		Località	MESTRE VE	Note	TASS 16.5 PREAVV VOL 0.86 1 BC REND	Volume	0,86
						Colli	1

Storia della spedizione

Codice	Data e Ora	Descrizione	Note
10	17/05/2005	Consegnato definitivamente	
4	16/05/2005	Consegna prevista	
3	12/05/2005	Partito dal magazzino di mittenza	

Servizio TTI --- 25/05/2005 12:36:53

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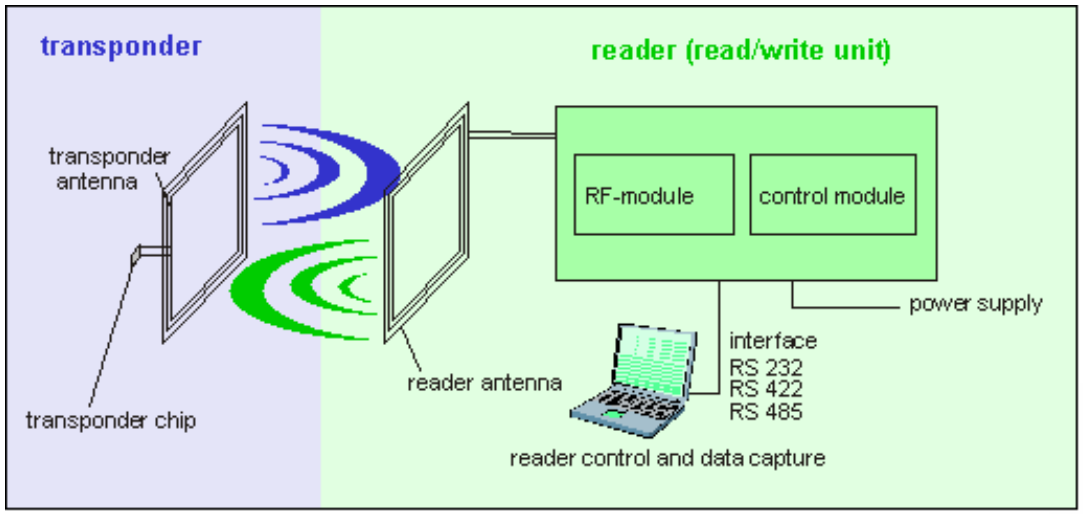
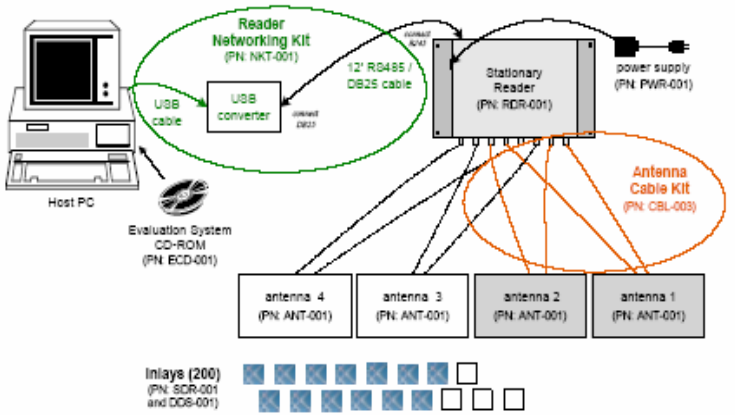
TTI Project





Limits:

- high Costs for Transponders and devices
- deciding if using the standard frequency (13.56 Mhz)
- Convincing operators to use RF-ID

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IT Automation for Railways “SHUNTING”

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Introduction

- Bologna Freight Village (BFV) decided to improve its railway IT infrastructure;
- After the study of the BFV processes some test application have been defined;
- A detailed analysis of the requirements has been carried out;
- Test applications are now under development and test.

Strategy & Methodology

The project idea originated from needs of INTERPORTO BOLOGNA (as Logisitcs Platform) and the requirements risen within the Bravo Project.

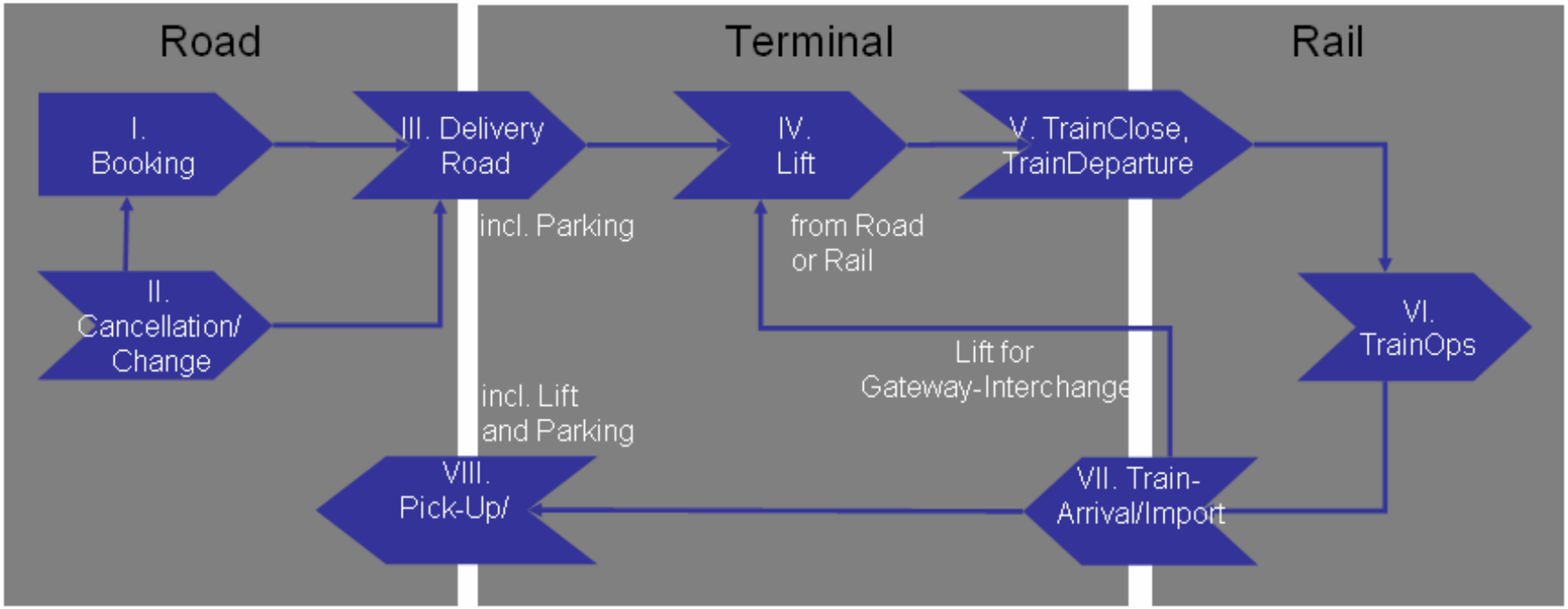
Hence main objectives have been defined :

- Optimization of information flow between different actors involved in intermodal transport;
- Develop core IT services following an international approach (new/different railway undertakings operating within the same Intermodal Terminal);
- Try to convey results of implementation of new IT services to Bravo Project Partners;

Process Analysis

- The first step for evaluating IT adoption starts with terminal analysis:
  - Identification of operators
  - Identification of processes
  - Identification of document flow
  - Identification of services to operators
  - Identification of optimization in process and automation

Process Analysis



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IT Systems

- Must be:
  - Flexible, that is accessible via webservices, via web page, via file upload
  - Expandable, that is modules can be added in the future and integrated in the current system
  - Mobile, that is it allows mobile operators on the field to communicate with the system

Case Study of Bologna Freight Village

Test Applications

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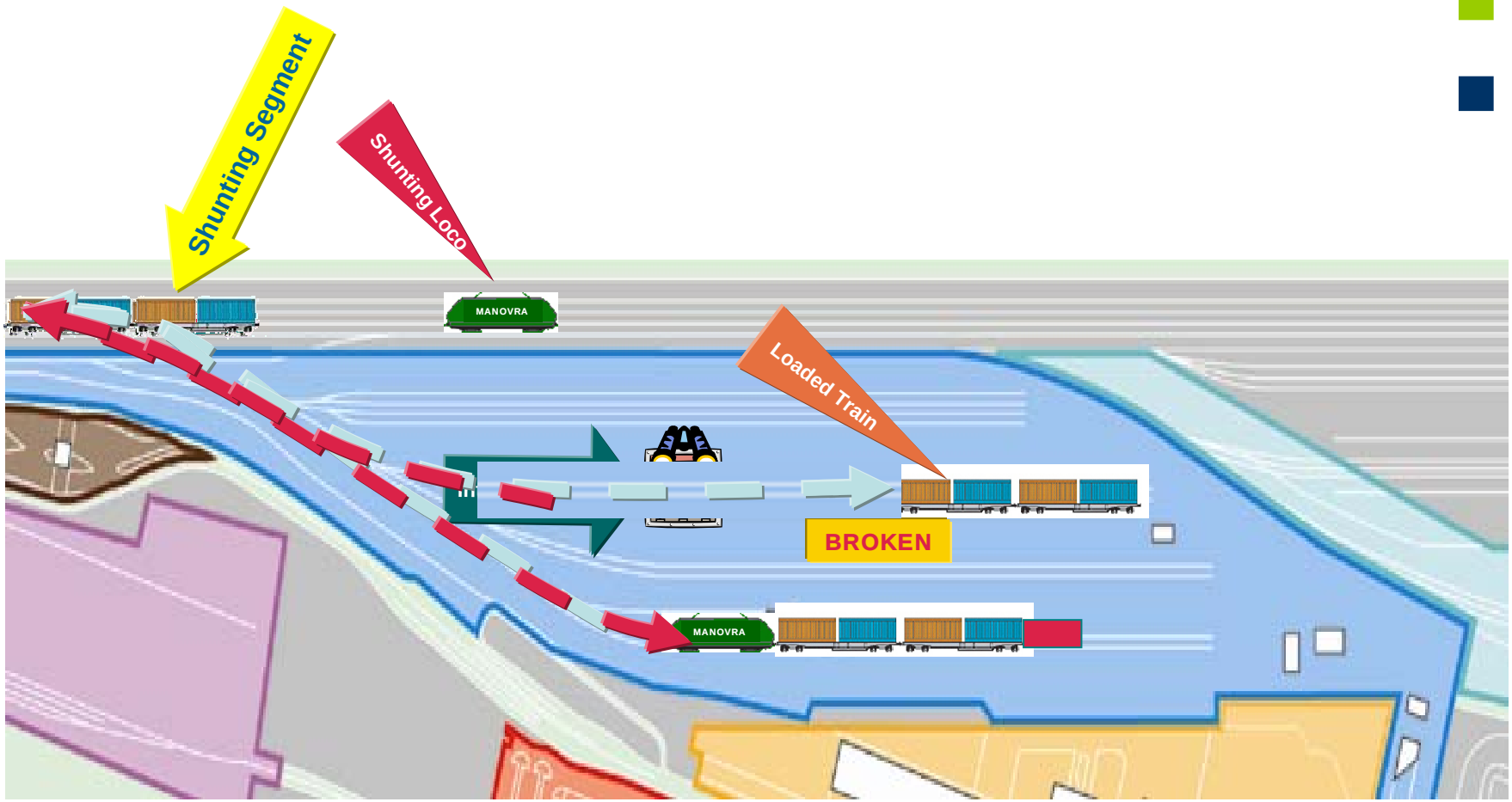
SHUNTING in TERMINAL Area

Operation Sequence for stop wagons



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Application under development

- Test applications that have been studied are:
  - GPS Monitoring System for locomotive (**SiMoG** project)
  - Shunting Automation Support (**ShunTer** project)

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GPS Monitoring System (SiMoG)

- Requirements:
  - Monitoring of locomotive position (for security reason);
  - Monitoring of locomotive speed (for security reason);
  - Generation of statistics related to paths, timetables, and several other parameters;
  - History of alarms.

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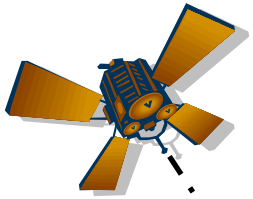
SiMoG Architecture

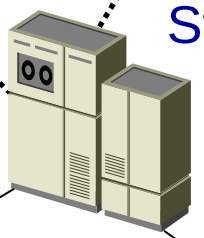


GPS signal

GPRS data

RAW data

Monitoring
Statistics



Mobile Software

Server Side software

Basic elaboration of GPS data
Transmission of raw data

Receives Raw Data
Elaborate graph information
Statistic pre-elaboration
Elaborate Monitoring data

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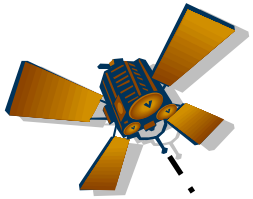
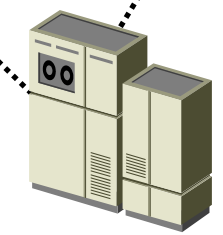
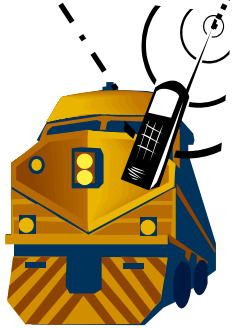
SiMoG operations



1 sample per second

Operator can monitor in real time data and consult statistics





5 samples are elaborated in order to have better accuracy and are sent via Internet by GPRS connection

Raw data are elaborated and information on statistics are generated. Real time Monitoring data are updated

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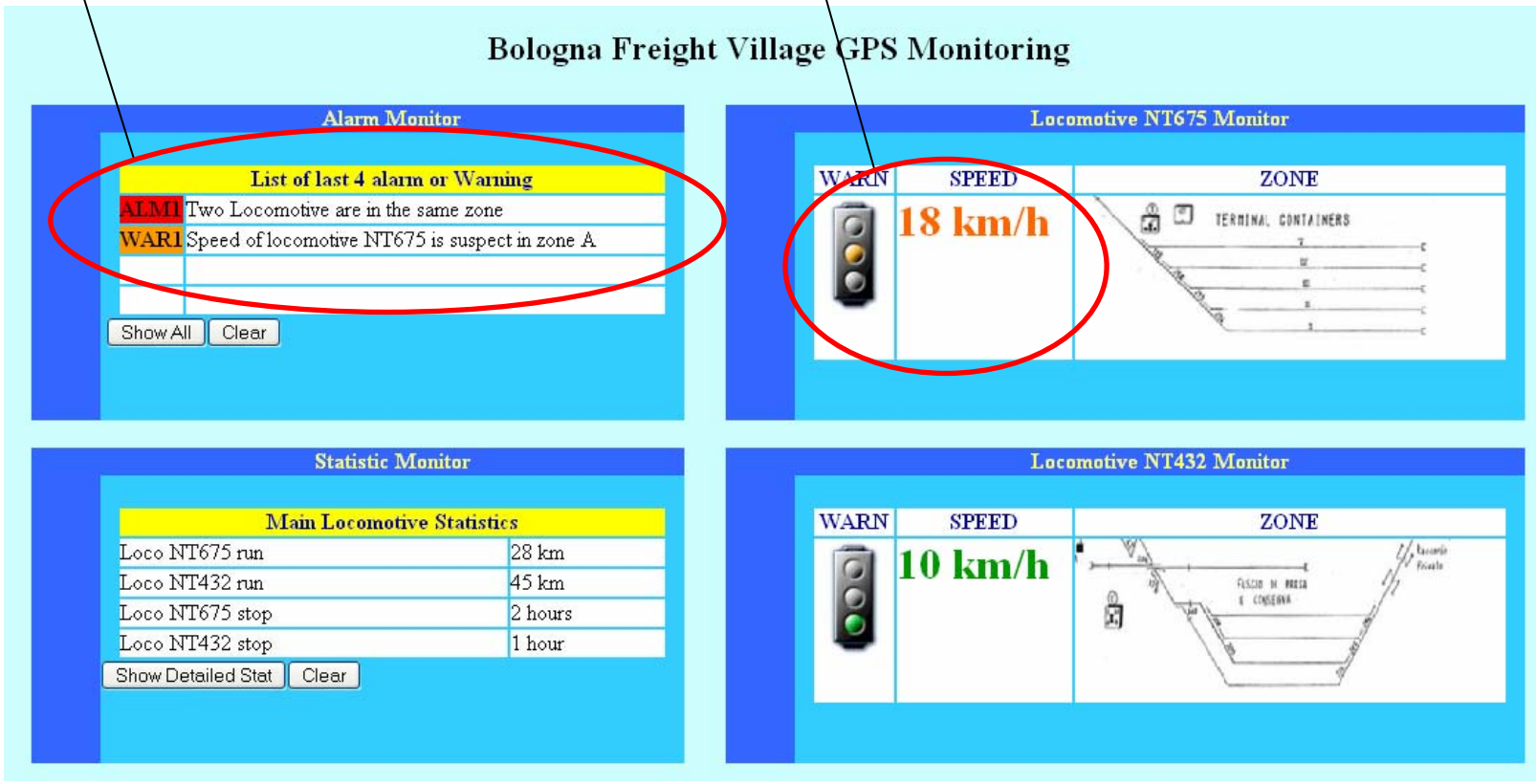
SiMoG Mock-Up Interface

Last alarms are displayed

Speed limit exceeded are shown



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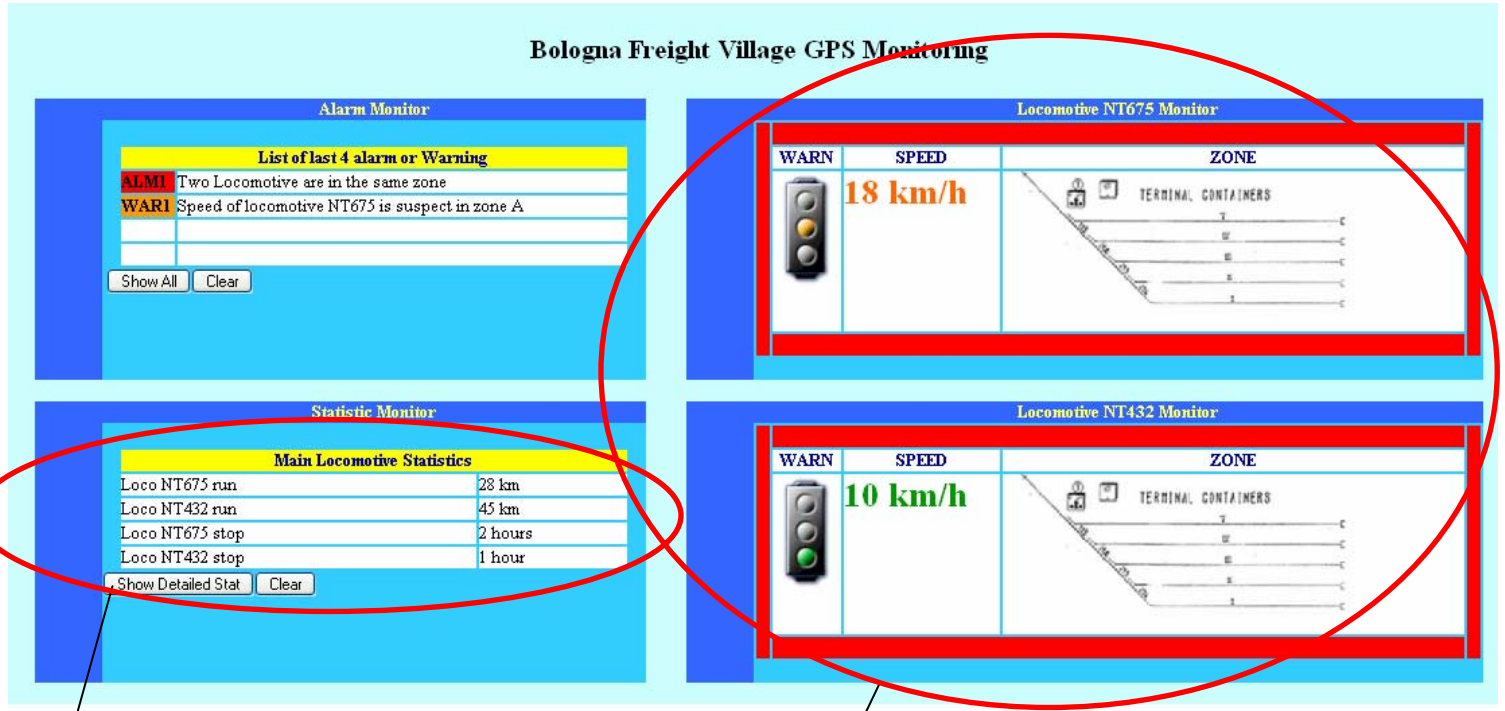
SiMoG Mock-Up Interface



Statistics are available

Danger is evidenced

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SiMoG Mock-Up Interface

- Monitoring of locomotive from with a GPS system will allow BFV to have a real time monitoring system for security reasons that monitors if a locomotive is exceeding the speed limit for a certain zone or if two locomotive are operative in the same zone.
- The collection of raw GPS data and the evaluation of such data allows to extract statistics that can be relevant for short term planning and also for medium-long term planning.
  - Short term planning can be improved by monitoring in several weeks how the turns of shunting people can be reorganized on the basis of the real activity of the locomotive.
  - Medium and long term planning is improved by analyzing the time slot of inactivity of locomotive that allows the freight village to organize new trains or to accept new trains.

Shunting Automation (ShunTer)

- Requirements
  - Generate shunting operation in situation where more than one train has to be composed;
  - Allow to set up priorities for trains;
  - Minimize the number of shunting operation;
  - Consider current way in which shunting is performed;
  - Consider shunting among different terminals inside the same freight village

ShunTer Architecture

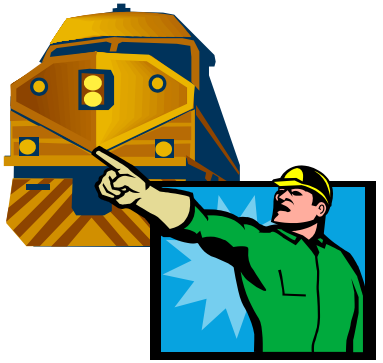
Shunting Manager

Wagon position update

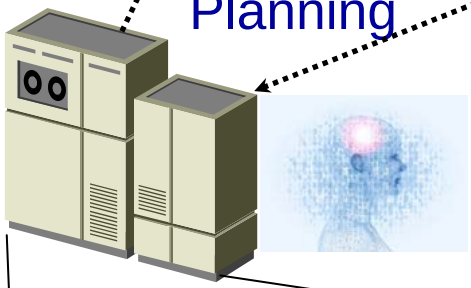
Shunting Planning

Shunting operations

Shunting confirmation



Shunting execution



Server Side software

- Receives Planning
- Artificial Intelligence Algorithm generates shunting operation
- Shunting sequence is transferred to mobiles

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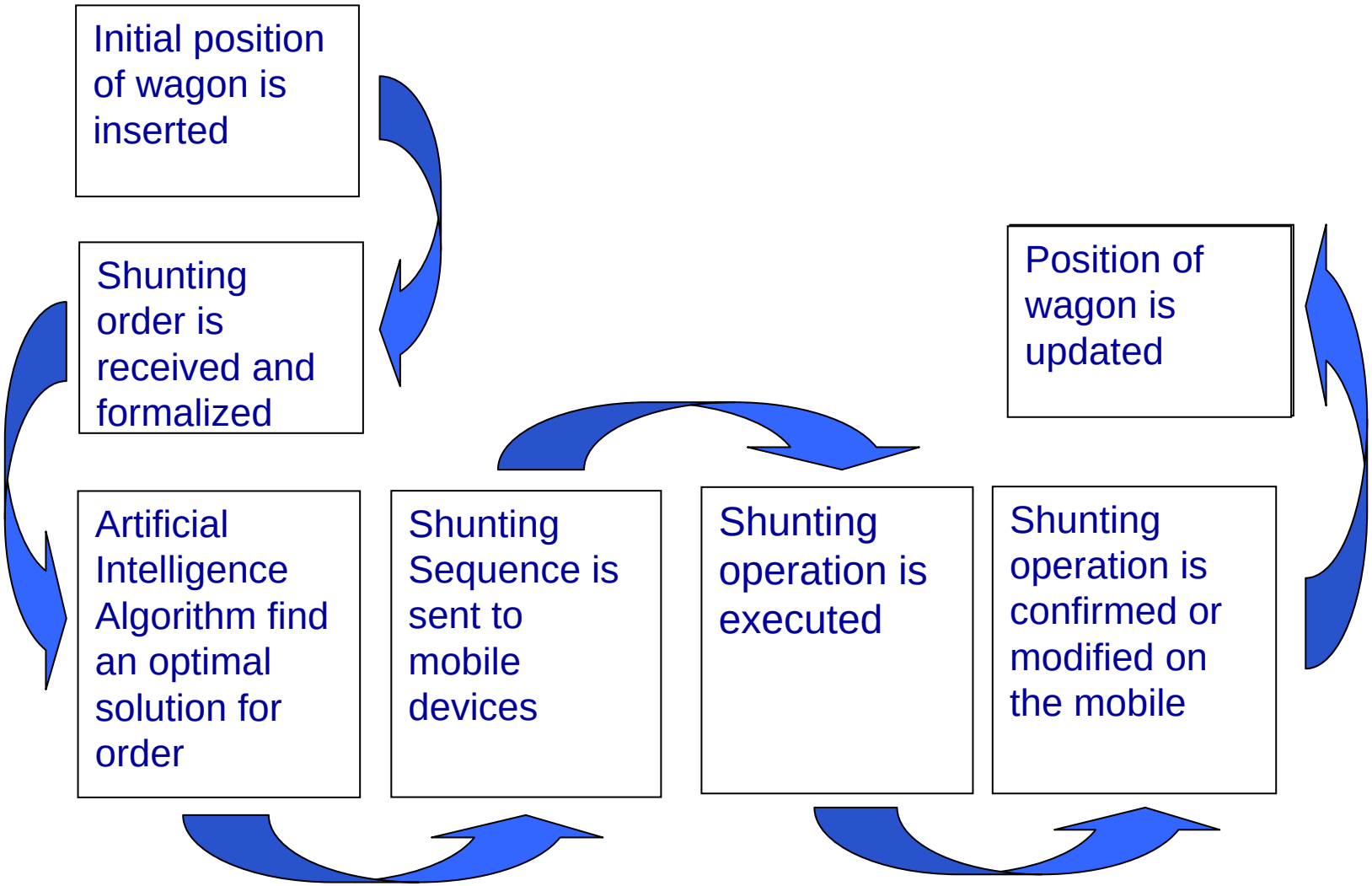
ShunTer Operation flow



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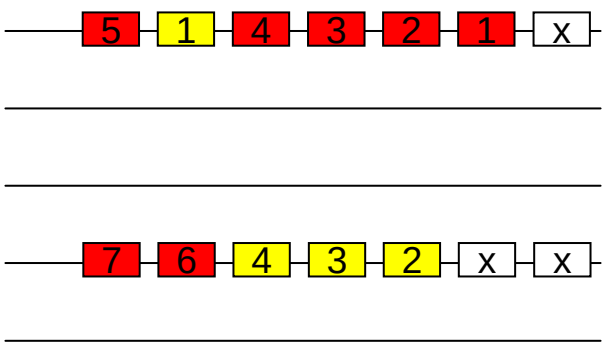
ShunTer … a sample



Shunting Order:

Compose RED train on TC2
(high priority)

Compose YELLOW train on TC3
(low priority)

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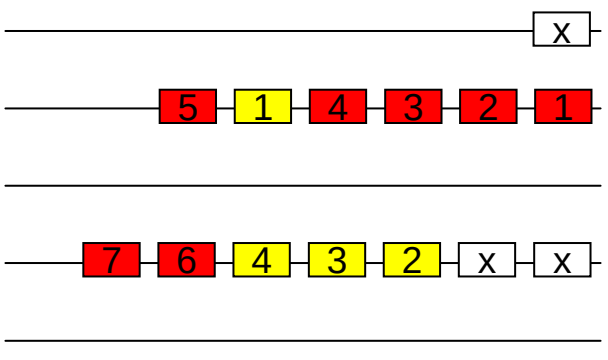
ShunTer … a sample



Shunting Order:

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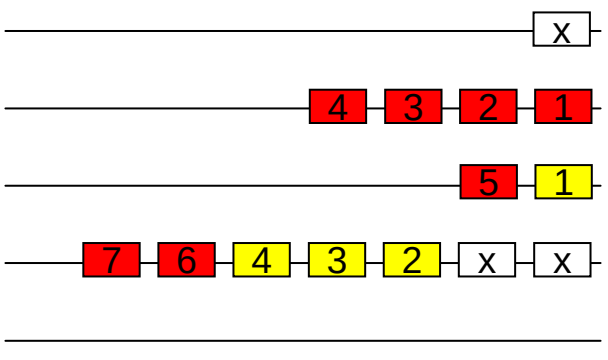
ShunTer … a sample



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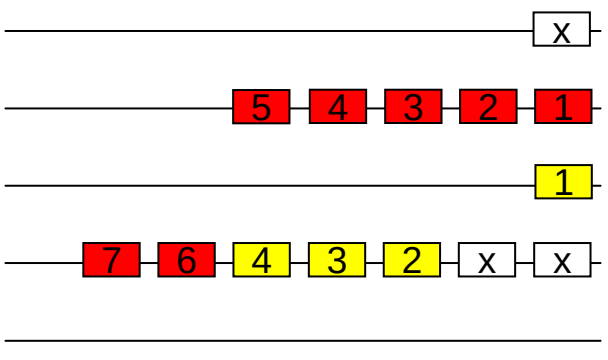
Interporto Bologna SpA

ShunTer ... a sample



Shunting Order:

Compose [illegible]ain on TC2 (high [illegible])

Done

Compose YELLOW train on TC3 (low priority)

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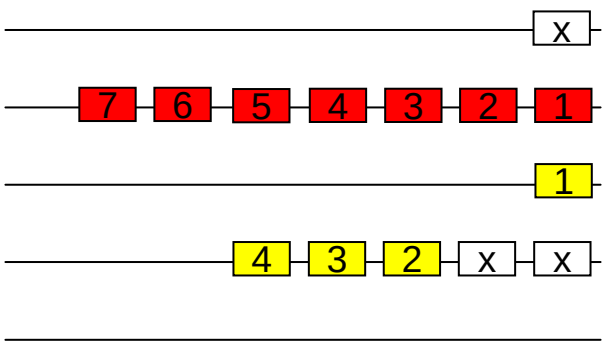
ShunTer ... a sample



Shunting Order:

Compose [illegible]ain on TC2
(high [illegible])

Done

Compose YE[illegible]train on TC3
(low prio[illegible])

Done

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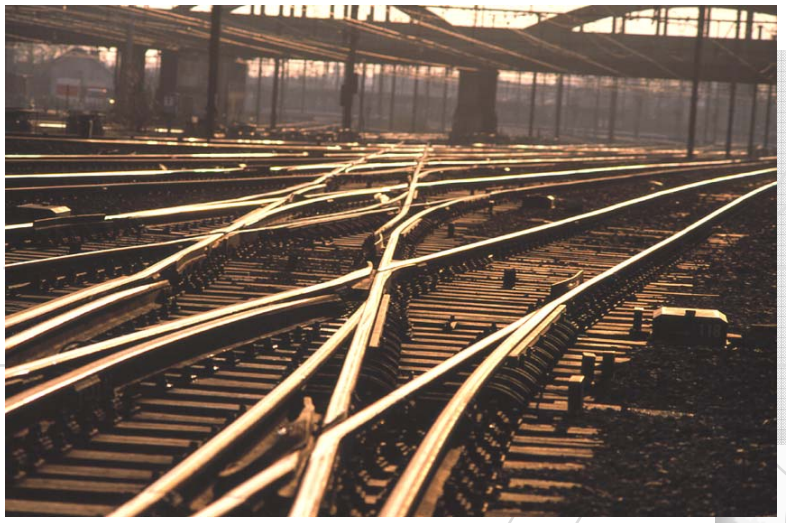
ShunTer benefits

- Shunting automation allows to reduce the number of movement that each locomotive have to perform for completing a shunting order reducing composition time and fuel consumption.
- The position of each wagon inside BFV will be monitored in real time with the information that can be associated to that wagon (type, length, weight, if it is empty, braking, etc).
- People that manages shunting can have in each instant a snapshot of the real situation of the tracks with the associated wagons, allowing an easier management of the shunting process and having a clear view of what is happening in case of problems.



TMove

IT Systems to support the management of railway operations

Interporto Bologna SpA

Interporto BO –

Track Occupation Monitoring

Shunting Management

STOPS Scheduled M541

Monitoring of outbound wagons

BOLOGNA FV

Preannouncement of inbound and outbound traffic

Preannouncement of inbound empty wagons

DGOL Station

SIR

Tracks Occupation **Monitoring** (for loading/unloading)

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Monitoring and Traffic Management → Planning and yard management → Storing management

IN BOUND Process

- Trains and wagons with final destination IPBO, are monitored from departure to their stop on the track for loading and unloading operations

- Real time evaluation of ETA, details on the full delay on route.

- **Composition of the train** : type of goods, wagons allocation, wagon features

Planning:

  - Shunting (loco used, shunters workshift)
  - Loading/unloading operations and related production activities
  - Stop riduction time at siding

Carichi					Vuoti Utilizzabili					Vuoti Riparandi				Altro			
8					3					1				0			
Rotabile	Pos. Tre.	Cod. Bin.	Pos. Bin.	Stt. Log.	Stt Fis.	Cod. Rip.	Staz. Orig.	Staz. Est.	Staz. Dest.	Cod. Lotis	Cliente	Ope. Tec.	Cod. Ava.	Mas. Fren.	Mas. Lorda	Tipo Merce	Dati Vari
318053584245	1			V	CP	102	010033		072264	70900	999999			53	72	72044910	
318054009150	2			V	CP	102	010033		072264	70900	999999			52	73	72044910	
318339161891	3			V	VR	R3F	069153		072264	70900	S1----		08	24	23		
338579160072	4			V	VU	090	002485		072264	70900	018039			36	35	99220000	
338779170996	5			V	VU	090	002485		072264	70900	018039			34	32	99220000	
318353032101	6			V	CP	E17	010306		072264	70900	018266			48	63	72042900	
318353769009	7			V	CP	E27	010306		072264	70900	018266						
318353016773	8			V	CP	E17	010306		072264	70900	018266						
318353200450	9			V	CP	E17	010306		072264	70900	018266						
318353002377	10			V	CP	E17	010306		072264	70900	018266						
318353014679	11			V	CP	E17	010306		072264	70900	018266						
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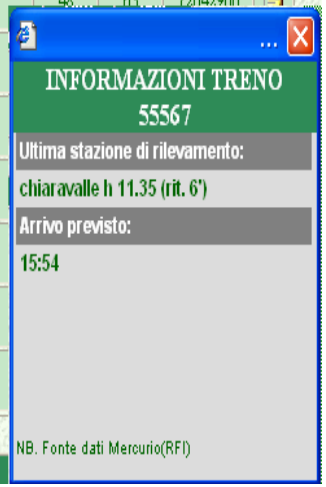
Pagina 1 di 1



Interporto Bologna SpA

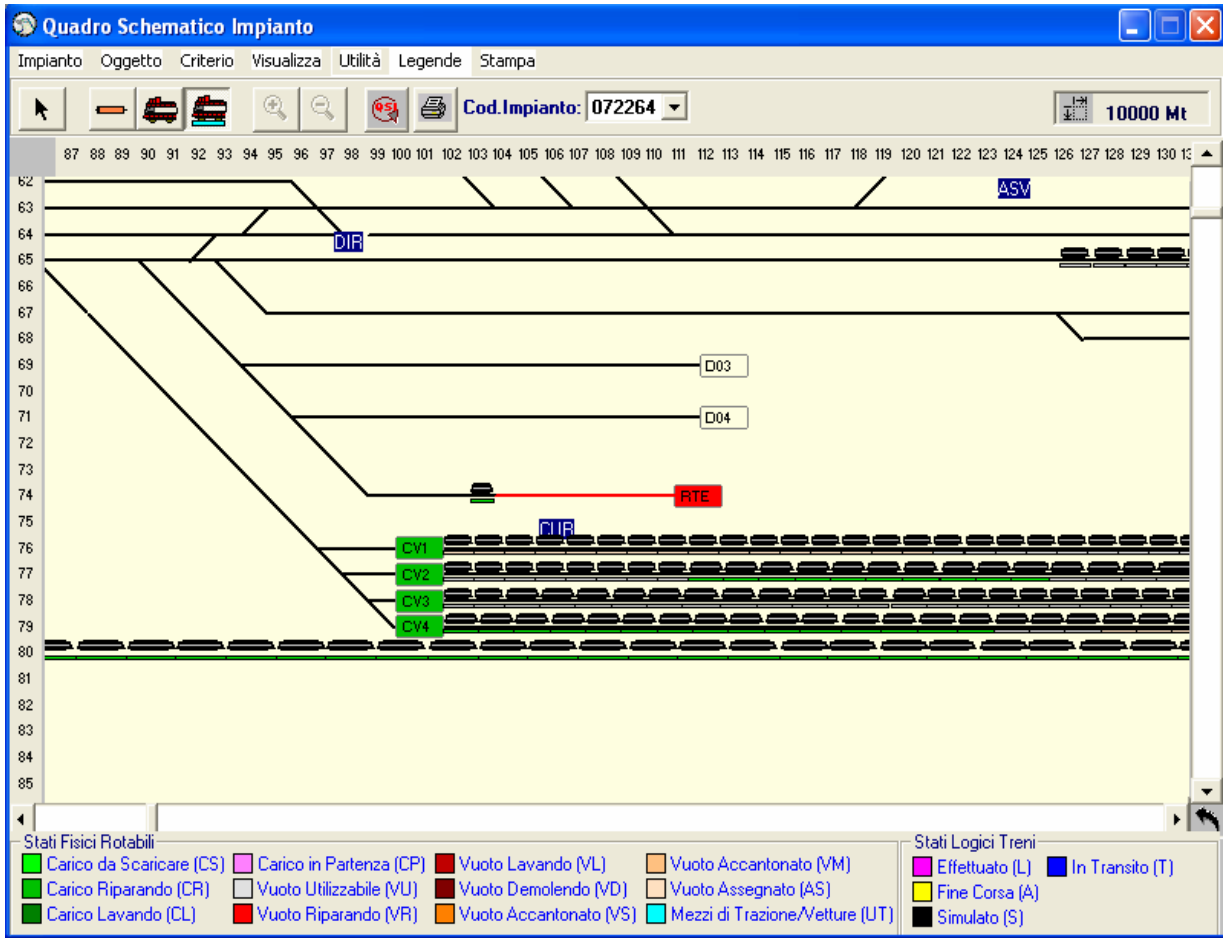
IN BOUND Process

Monitoring and Traffic Management → **Planning and yard management** → **Storing management**

The picture shows:

- Tracks
- siding tracks for loading and unloading operations

The tracks occupation is updated in real time starting from the shunting operations up to arrival and departure time.



Interporto Bologna SpA

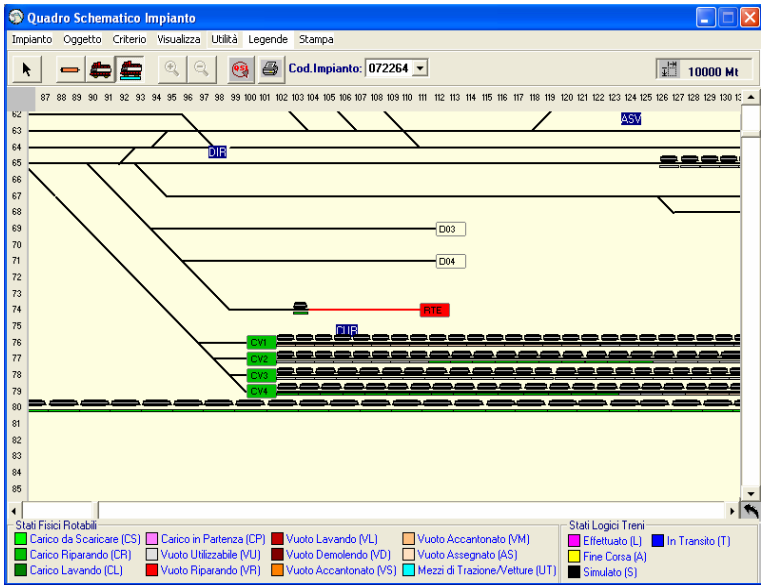
IN BOUND Process

Monitoring and Traffic Management → **Planning and yard management** → **Storing management**

For each wagon placed on tracks are available:

- technical information (type of wagon, length, tare weight, axles
- Commercial information (type of good, weight, dangerousness)
- Stop time Duration on siding tracks

Data are available also via GPRS-PDA for the operators

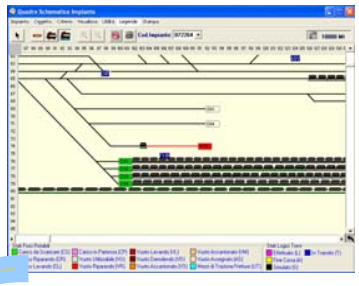


Interporto Bologna SpA

IN BOUND Process

Monitoring and Traffic Management → **Planning and Yard management** → **Storing management**

Inputing data concering shunting through PDA (by the operators positioned next to tracks)



Interporto

- Stop time on siding tracks real time updating.
- Monitoring of the terminal Tracks
- Integrated Storing Management

DGOL

- Stop time on siding tracks real time updating.
- Monitoring of the terminal Tracks for loading and unloading.

Interporto Bologna SpA

OUTBOUND Process

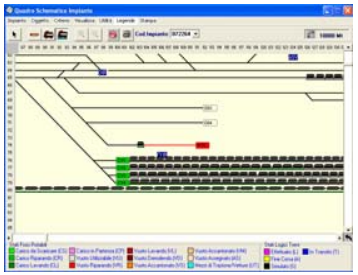
Monitoring and Traffic Management → **Planning and Yard management** → **Storing management**

Interporto

- Preannouncement of inbound and outbound rolling stocks: type of wagon; technical features
- Printing of M541
- Out-bound Rolling stocks Recording Registrazione manovra materiale in uscita.
- Stop time (available on line)

DGOL

- Shunting activities Planning (loco to be used, shunters workshift)
- Activity Planning for inspector/train assembler
- Maintanance-shop planning
- Loading and unloading tracks On-line Monitoring



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Thanks for your attention

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