

High Speed & the city

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Introduction



Introduction



UIC has conducted, in 2010, a research on the impact of High Speed Rail (HSR) on stations.

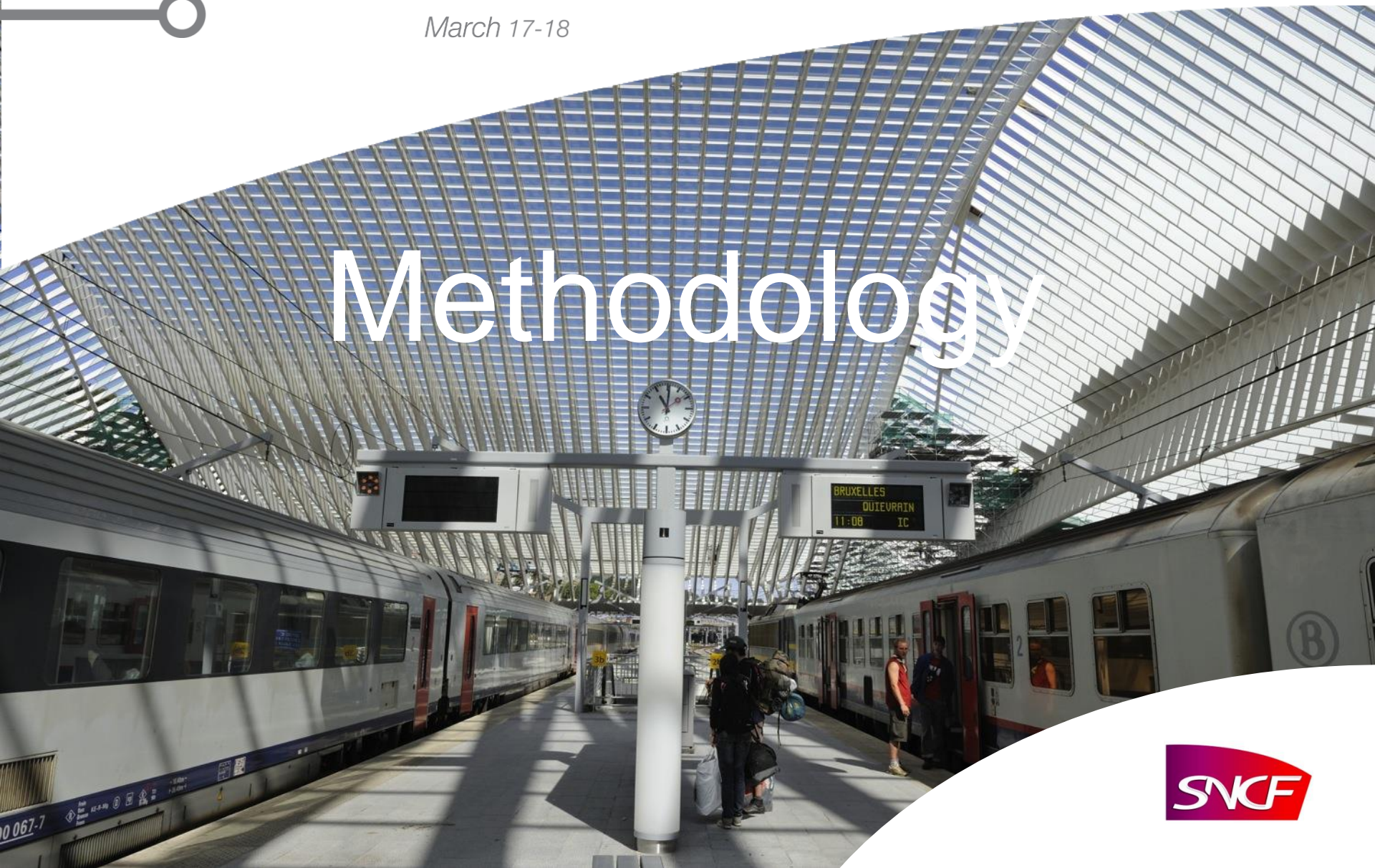
This presentation aims at providing the audience with the main findings of this research.

Let's introduce the issue by asking a question:

A High Speed Train (HST) is just a train running at a higher speed on new lines. Nevertheless, it is similar to a conventional train when it is inside a station.

So, why should High Speed Rail specifically change the station?

Methodology



Methodology



The tender documents for this research were based on comparisons between the situation before and the situation after the commissioning of a High Speed Line (HSL), for a given station or city.

Methodology

The tender documents were also based on the focussing on 4 various viewpoints since a station is a 4-actor meeting point

passenger

city

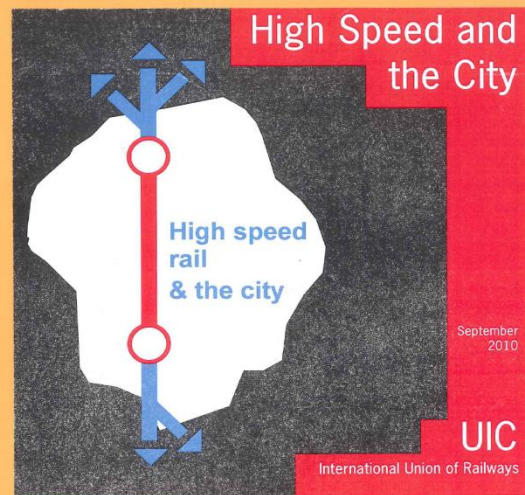


HSR
operator

Infrastructure
manager

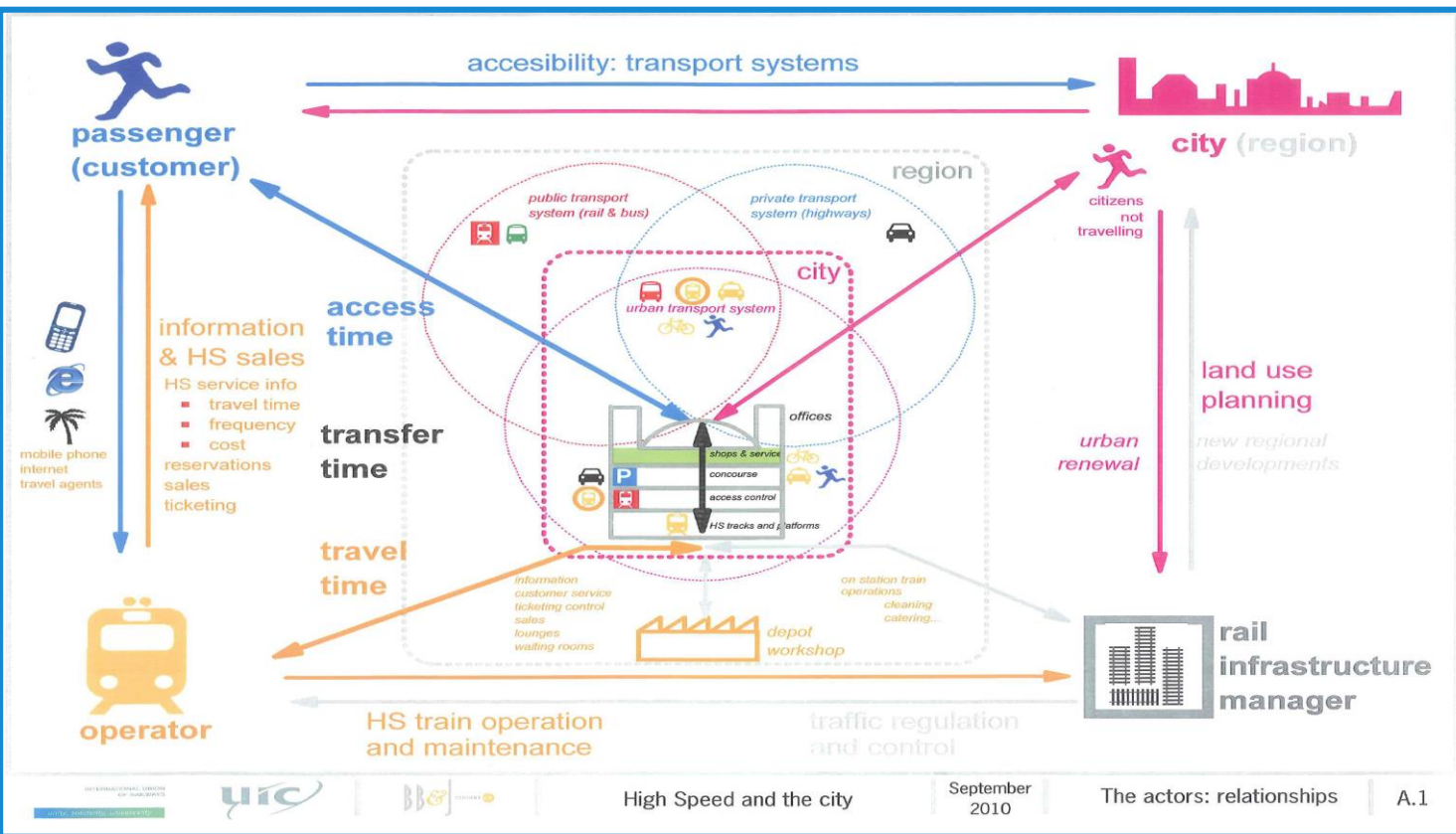
Methodology

We selected **BB&J Consult**, a Spanish consultant, for this purpose



BB&J CONSULT SA

Methodology



Methodology

12 stations located in countries operating HSR have been analyzed.



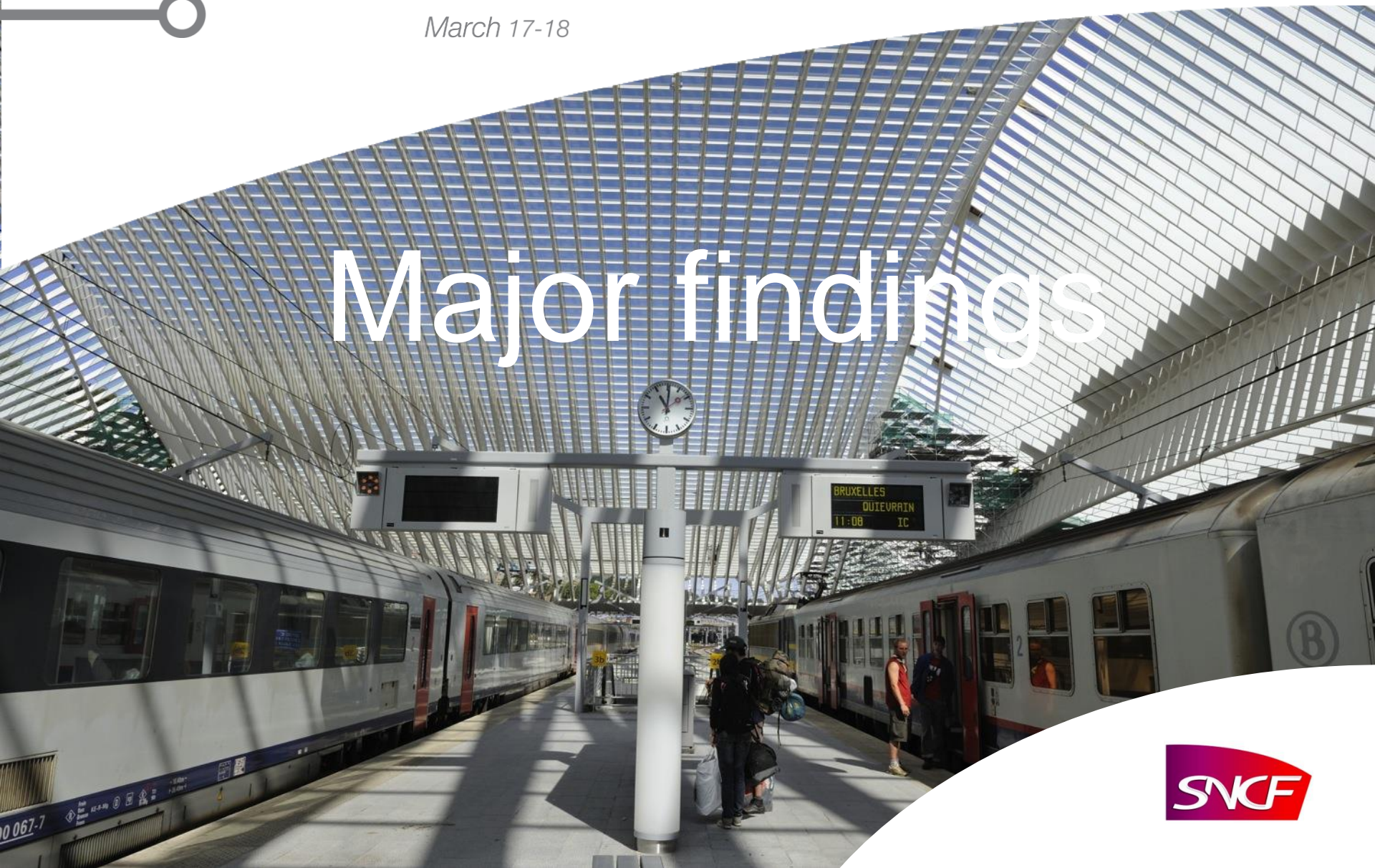
Methodology



It has not been possible to compare the situations before and after the commissioning of HSR because data are not available.

So the methodology has shifted towards a benchmark of stations.

Major findings



Major Findings



High Speed Trains have **one only specificity**: they run faster.

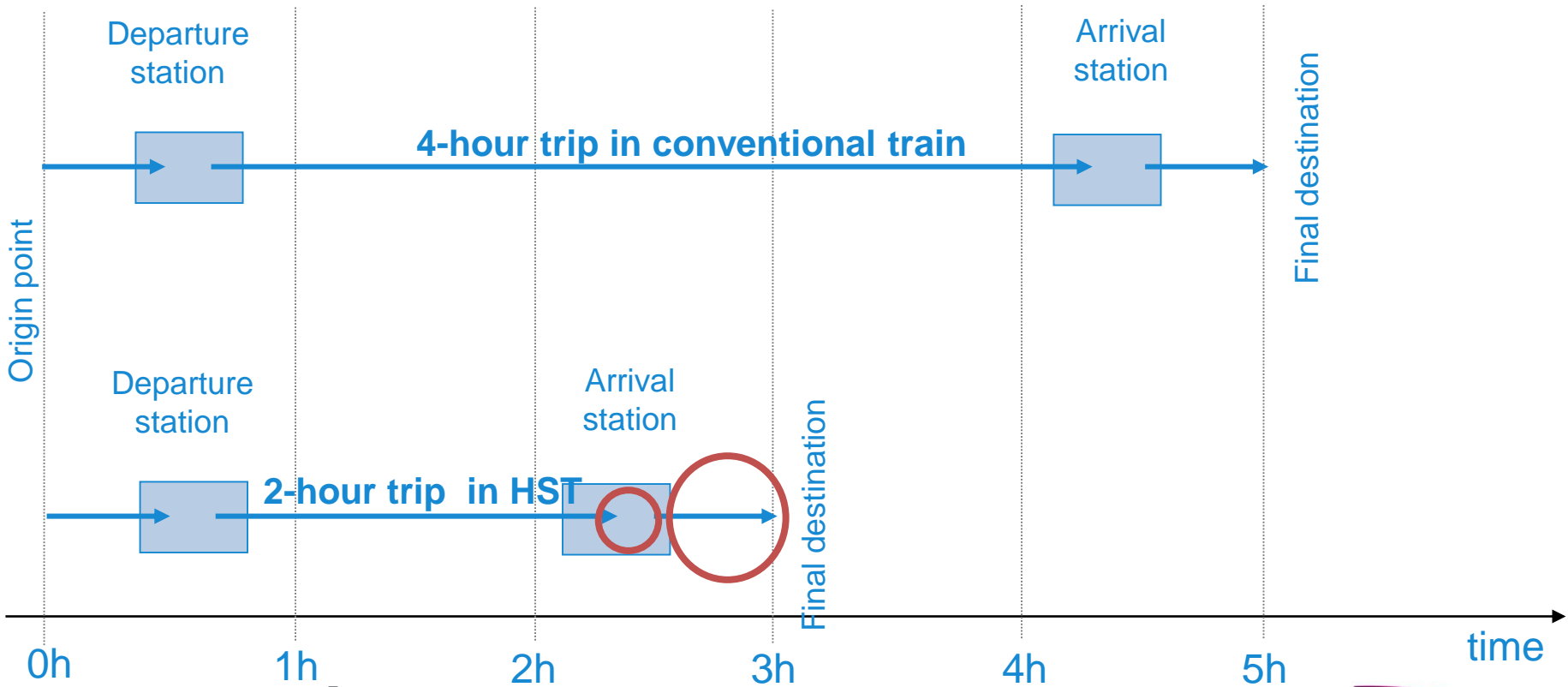
However this capability brings **two major changes** in:

- the perception of time by the passenger
- the rail traffic volume.

Both changes lead the 4 actors to envision differently the station.

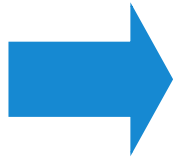
Major Findings

The perception of time by the passenger



Major Findings

The traffic growth



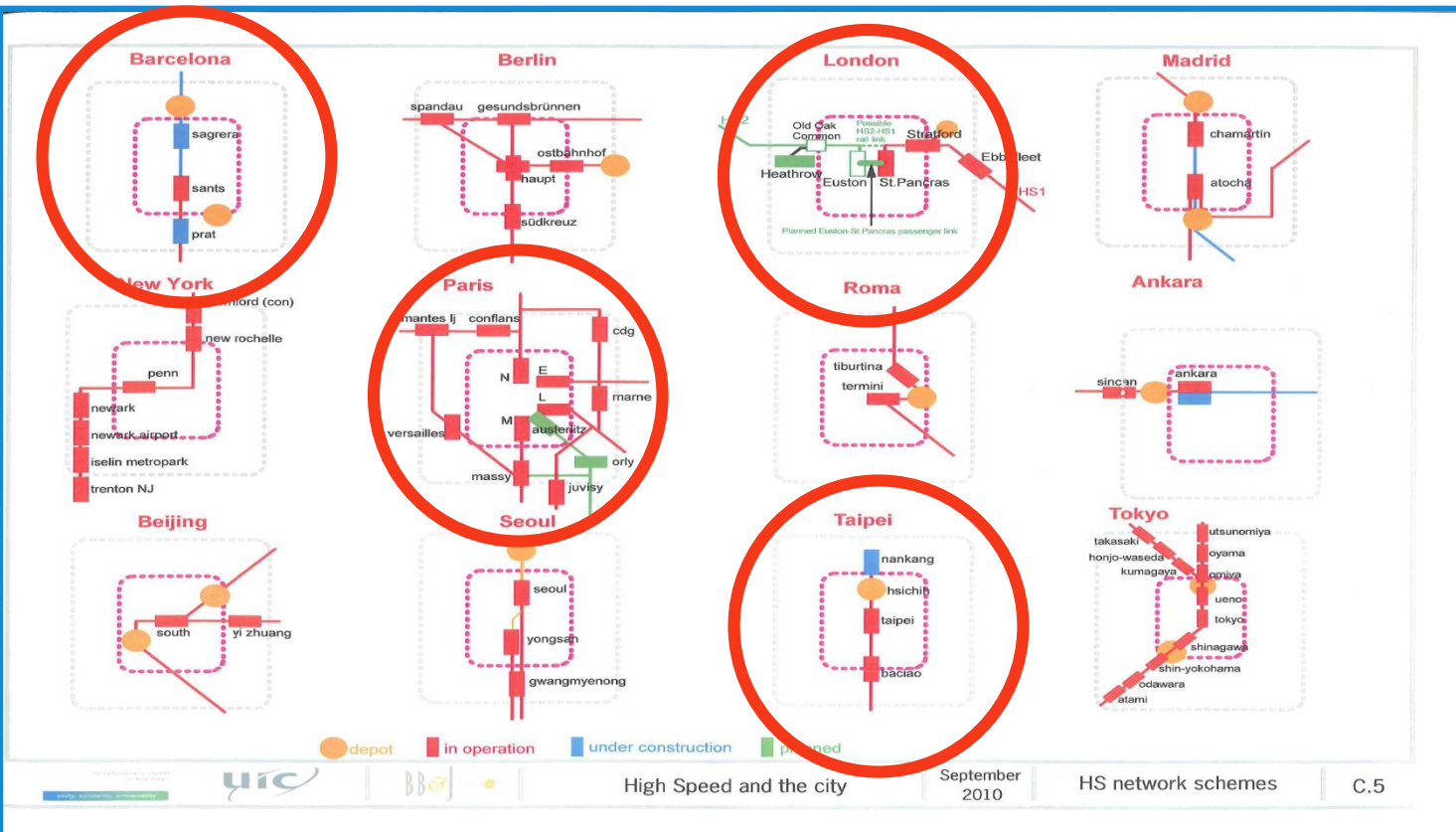
More people



New expectations

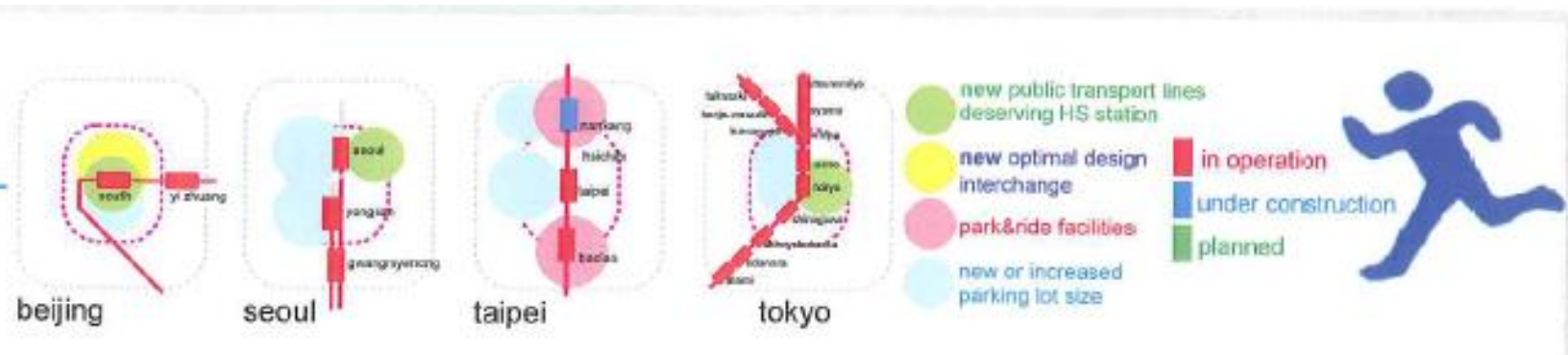
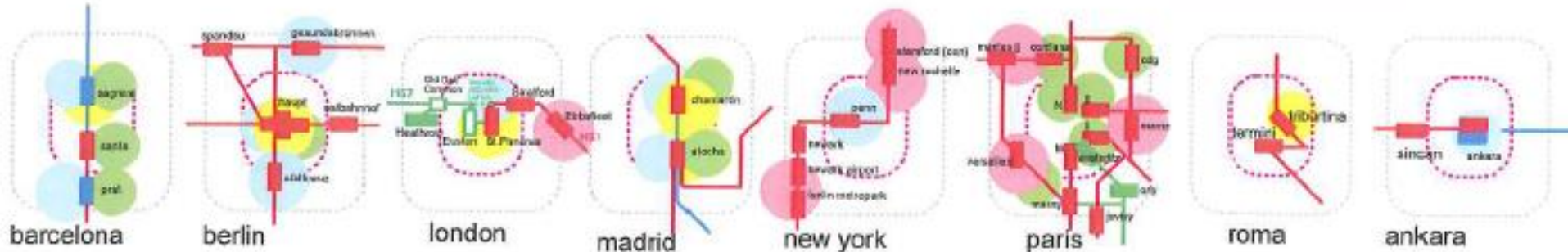


Major Findings



Quite often HSR leads towards new locations along with a change in the operating pattern

Passenger's viewpoint



HSR never comes alone





Passenger's viewpoint

Automatic ticket machines

Conexion with subway lines

Diagram illustrating the connection between HSR fare gates and subway lines (TRA/THSR, MRT, and HSR) at Taipei Main Station.

passenger

- Keeps the same through scheme with depot at north
- Shared lines by HS and conventional trains
- Future connection with Taoyuan airport by the "Taoyuan airport MRT System" is planned for completion in 2014

Information desks and ticket booths

Taipei Main Station Location Map

Accessibility	High Speed stations in the city	1
	Total Region High Speed stations	3
	Nr of subway lines at the station	3
	Nr of commuter lines at the station	-
	Nr of bus routes at the station	-
	Subway st reached without transfer	39
	Commuter st reached without transfer	-
	Nr of public parking lot spaces	322
	Car parking fare (€/day)	-
	Bike renting fare (€/day)	-
Rent a car companies	-	
Security Control?	-	
Ticket control?	-	
Travel fares	First city	Zuoying
	travel fare by High Speed train (€)	22,5
	travel fare by Conventional train (€)	-
	travel fare by Car (€)	34
travel fare by plane (€)	50	

High Speed and the city

September 2010

Taipei Main station
Passenger point of view

B.16.1

TAIPEI:

HSR
was created
from scratch

Passenger's viewpoint

RER line B platforms at the station



Connection airport-station



passenger

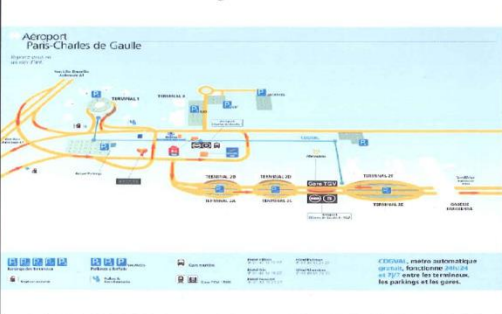


- Average of 10 minutes walking to Charles de Gaulle airport terminals
- Connection with RER line B. RER tracks adyacent to TGV tracks
- Not connections with metro system
- Huge parking shared with airport passengers with 15.000 spaces
- Large ticket booths, with long waiting time
- Direct access via the A1 Autoroute
- Taxis are available in front of the RER station

Info panels and automatic ticket machines



Station accessibility



Accessibility	High Speed stations in the city	4
	Total Region High Speed stations	11
	Nr of subway lines at the station	0
	Nr of commuter lines at the station	1
	Nr of bus routes at the station	12
	Subway st reached without transfer	0
	Commuter st reached without transfer	42
	Nr of public parking lot spaces	15.000
	Car parking fare (€/day)	48
	Bike renting fare (€/day)	1
	Rent a car companies	1
	Security Control?	no
Ticket control?	yes	

Travel fares	First city	Lyon
	travel fare by High Speed train (€)	65
	travel fare by Conventional train (€)	-
	travel fare by Car (€)	72
	travel fare by plane (€)	200

PARIS CDG:

a full fledge network

HSR may entail the creation of new stations

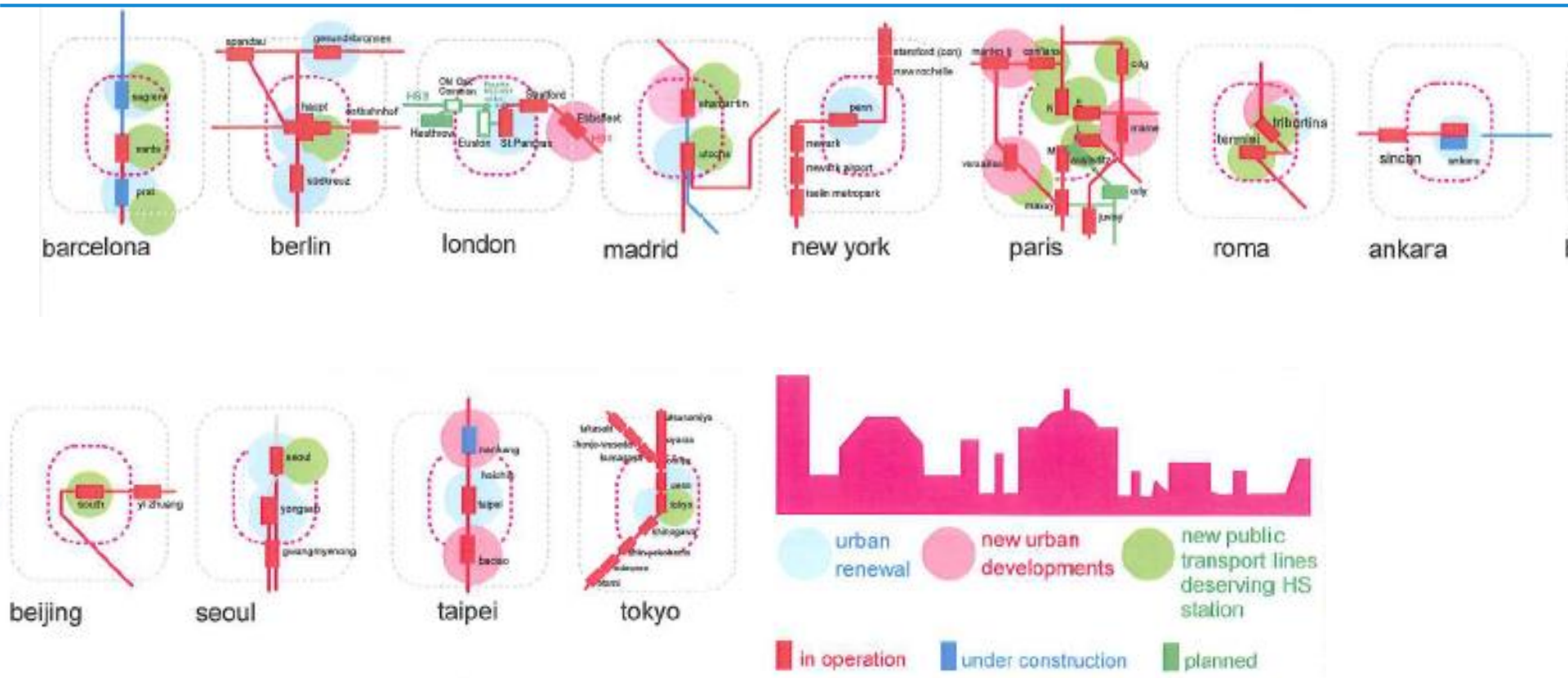
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Paris-CDG
Passenger point of view

B.8.1

City's viewpoint



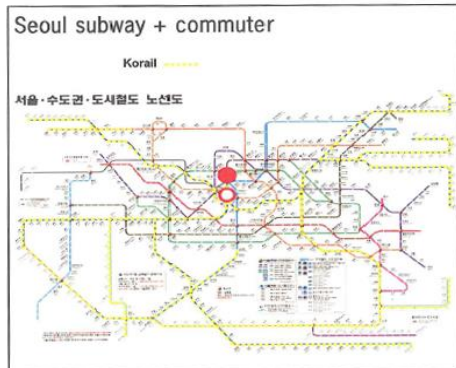
HSR never comes alone



City's viewpoint



- First remodeling of station: other tracks in service
- Second huge urban project: convention center, new north track yards
- New commuter line in service
- Future commuter line connecting with both airports (Incheon and Gimpo). In construction



City numbers	City population	10,464,061
	City area (Km ²)	605
	City density (hab/Km ²)	17,289
	Region population	24,472,063
	Region area (Km ²)	5,076
	Distance City Hall-Station (Km)	1,5
	International visitors a year	12,000,000
	Domestic visitors a year	-

P.U.T	Metro ridership in the city area (pax/day)	8,000,000
	Commutership in the city area (pax/day)	4,531,000
	Bus ridership in the city area (pax/day)	-
	Tram ridership in the city area (pax/day)	-

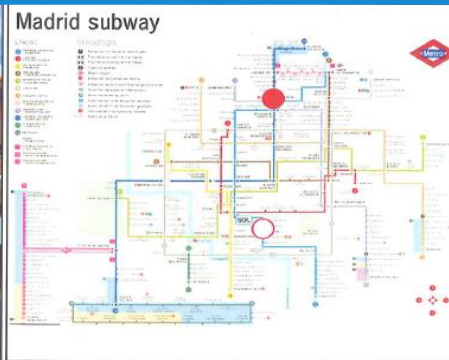
Travel time	First destination	Busan
	travel time by High Speed train	2hr50min
	travel time by Conventional train	5hr
	travel time by Car	4hr30min
	travel time by plane*	55min
*only travel time		

Urban develop. Total area planned (Ha)	28,05
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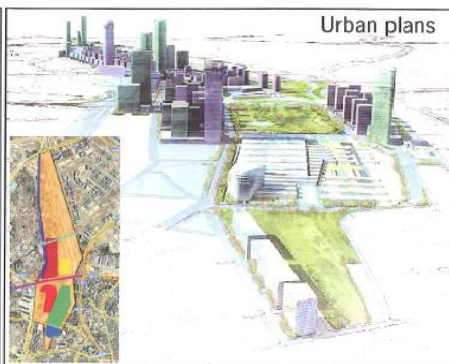
SEOUL:

Huge urban development
Right above and around the station

City's viewpoint



- Big Urban development project over rail footprint (station yard and depot)
- Nearby 4 towers (outside rail land) 250 m high
- New metro lines to station and interchange



City population	3.255.944
City area (Km2)	607
City density (hab/Km2)	5.364
Region population	6.386.932
Region area (Km2)	10.506
Distance City Hall-Station (Km)	6
Internacional visitors a year	7.193.179
Domestic visitors a year	

Metro ridership in the city area (pax/day)	1.916.667
Comm ridership in the city area (pax/day)	940.000
Bus ridership in the city area (pax/day)	1.277.778
Tram ridership in the city area (pax/day)	

First destination	Valladolid
travel time by High Speed train	1hr
travel time by Conventional train	2hr40min
travel time by Car	2hr15min
travel time by plane*	-
*only travel time	
Urban develop. Total area planned (Ha)	312

MADRID CHAMARTIN:

HSR is the spark for a global revision of the land use in the station district



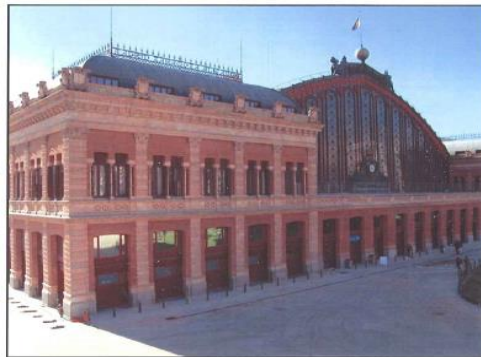
High Speed and the city

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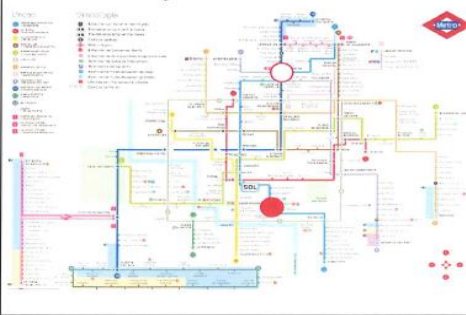
Madrid-Chamartín
City point of view



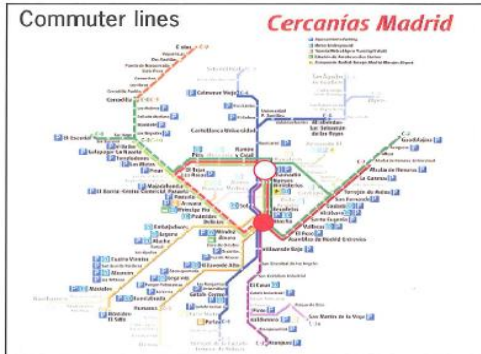
City's viewpoint



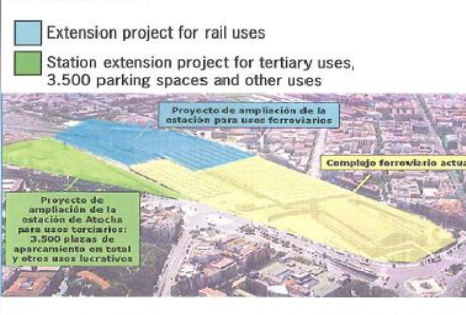
Madrid subway



- Atocha area revitalization
- No real estate projects
- All surfaces commercial, parking... within station footprint
- Station being enlarged and parking lot extended



Urban plans



City numbers	City population	3.255.044
	City area (km2)	607
	City density (hab/km2)	5.364
	Region population	6.986.932
	Region area (km2)	10.506
	Distance City Hall-Station (km)	2
	International visitors a year	
	Domestic visitors a year	7.193.179

P U T	Metro ridership in the city area (pax/day)	1.916.667
	Comm ridership in the city area (pax/day)	940.000
	Bus ridership in the city area (pax/day)	1.277.778
	Tram ridership in the city area (pax/day)	

Travel time	First destination	Barcelona
	travel time by High Speed train	2hr40min
	travel time by Conventional train	9hr(bef HS)
	travel time by Car	6hr30min
	travel time by plane*	1hr15min
	*only travel time	
	Urban develop. Total area planned (Ha)	25,05

MADRID ATOCHA:

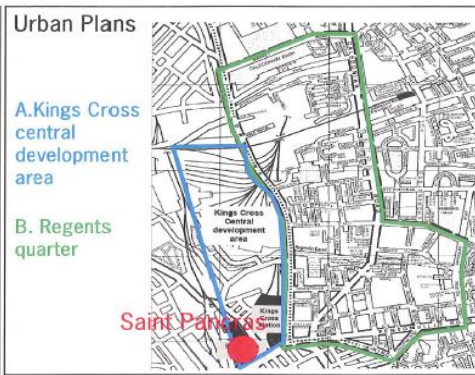
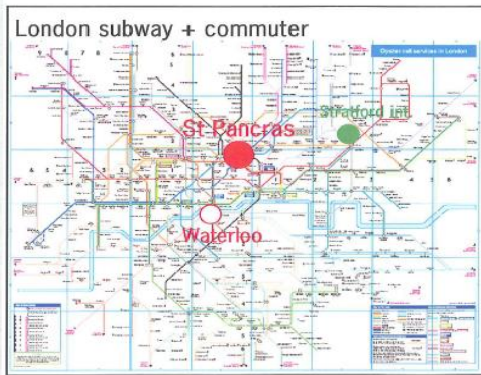
HSR is the spark for a global revision of the land use in the station district



City's viewpoint



- Two huge urban renewal and development operation (34 Ha)
- Revitalization of the station quarter
- Ebbsfleet development for P&R



City numbers	
City population	7.556.900
City area (Km2)	1.579
City density (hab/Km2)	4.761
Region population	13.945.000
Region area (Km2)	16.043
Distance City Hall-Station (Km)	2,5
International visitors a year	26.100.000
Domestic visitors a year	
P.U.T.	
Metro ridership in the city area (pax/day)	2.900.000
Comm ridership in the city area (pax/day)	2.100.000
Bus ridership in the city area (pax/day)	5.100.000
Tram ridership in the city area (pax/day)	100.000
Travel time	
First destination	Ashford
travel time by High Speed train	40min
travel time by Conventional train	
travel time by Car	1hr10min
travel time by plane*	-
*only travel time	
Urban develop. Total area planned (Ha)	34

LONDON St PANCRAS:

Revitalization
of an old station
And of
the surrounding
district
+
creation
of Ebbsfleet
station

High Speed and the city

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2010

London St Pancras
City point of view

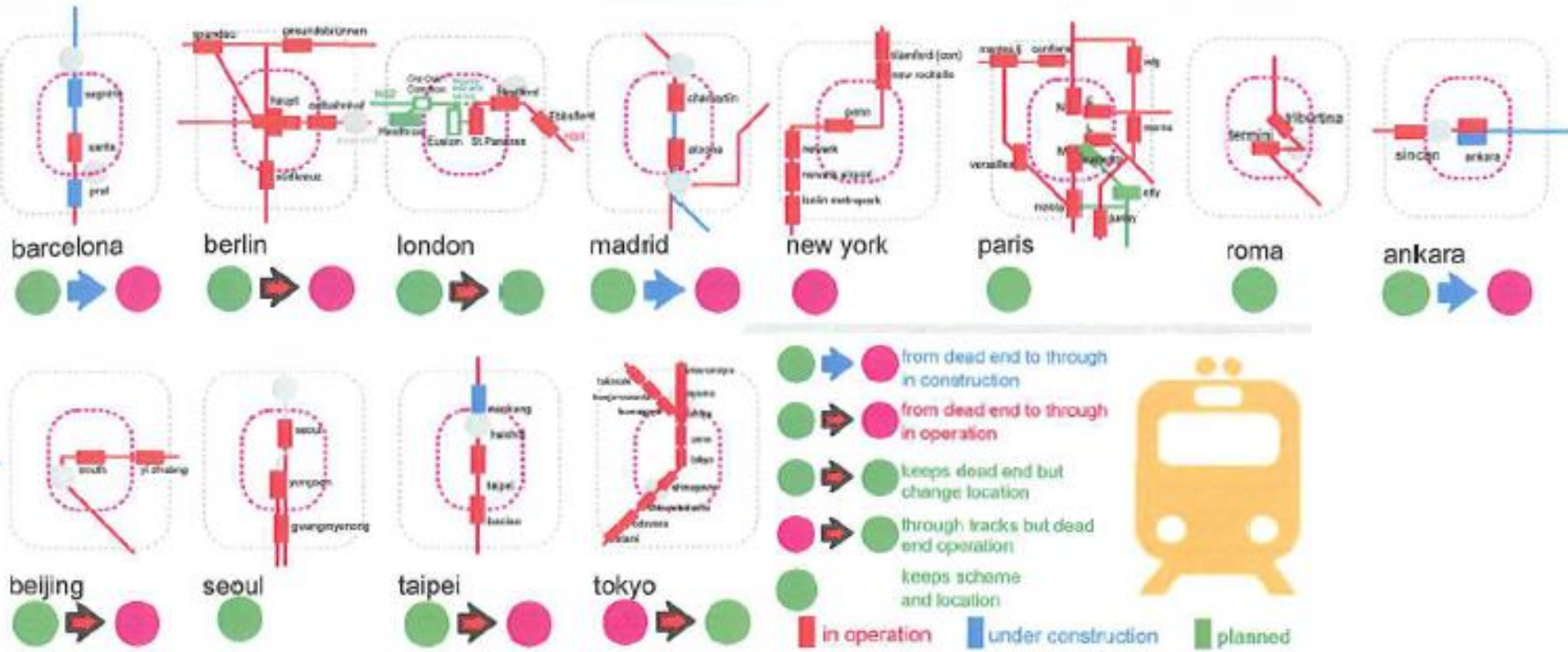
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March 17-18



Operator's viewpoint



HSR quite never comes alone



Operator's viewpoint

Services

Southeastern services

London High Speed Rail and connections to domestic main lines

operator

- Initial HS services from Waterloo station
- Change to St Pancras in 2007
- Better quality of service (punctuality increased)
- New domestic HS services started in Dec 2009, going from St Pancras to the Medway towns, stopping at Stratford and Ebbsfleet international
- Eurostar operates international HS services and Southeastern operates domestic HS services

Train at St Pancras

Inside the station

Line	Operator	Eurostar&Southeast
Station type (services)		Dead End
Opened date		14-nov-07
High Speed lines from/to station		4
High speed total length (Km, country)		113
HS Services a day (both ways)		60
Passengers a day		17,778
% city HS trains going through this station		100
First destination		Ashford
HS Services a day (both ways)		34
% city trains going to this destination		56,67%

Trains		
Maximum speed (Km/hour)		300
Length (m)		394
Cars per train		18
Total seats		750
Platform occupancy time (min)		22

Station		
Info panels		yes
Automatic ticket machine		yes
Lockers		yes
Turnstile/entrance		yes

High Speed and the city

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London St Pancras
Operator point of view

B.4.3

LONDON St PANCRAS:

Shifting from one terminal (Waterloo) to another (Saint Pancras)

Operator's viewpoint

BARCELONA SAGRERA:

From
A dead end
to a
through
station



operator



- Station under construction
- Future high speed line through Figueres to France
- Termini station for all trains coming from the peninsula
- All trains will stop at both stations
- New tunnel linking both stations will increase capacity considerably, with more trains a day



Train at the station



Inside the station

		RENFE
Line	Services type	Through
	Opening date	-
	High Speed lines from/to station	2
	High speed total length (Kms, country)	1.589
	HS Services a day (both ways)	75
	Passengers a day	62.500*
	% city HS trains going through this station	100
	First destination	Madrid
	HS Services a day (both ways)	54
	% city trains going to this destination	71,05%
		*expected val
Trains	Maximum speed (Km/hour)	300
	Length (m)	200
	Cars per train	8
	Total seats	404
	Platform occupancy time (min)	-
Station	Info panels	yes
	Automatic ticket machine	yes
	Lockers	yes
	Turnstile/entrance	-

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Barcelona-Sagrera
Operator point of view

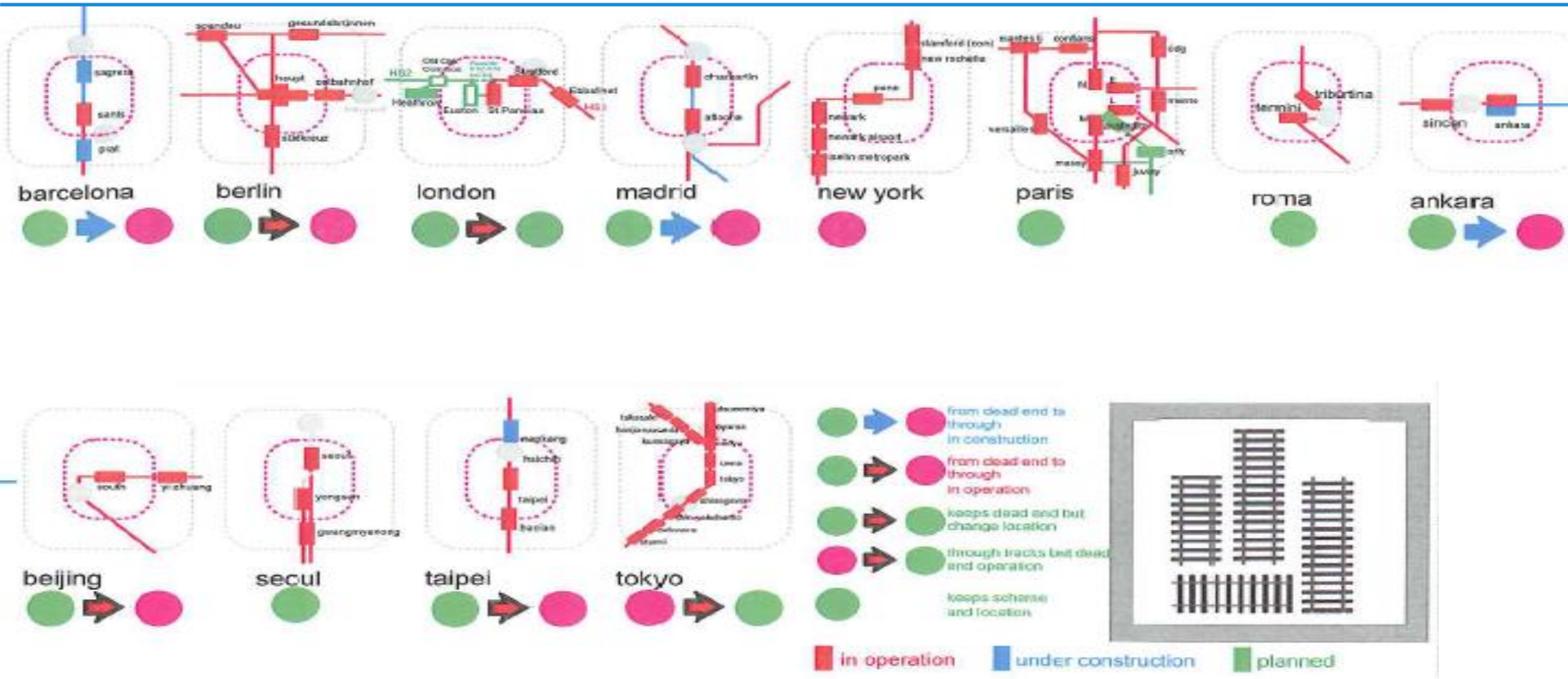
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Infrastructure Manager's viewpoint





Infrastructure Manager's viewpoint



Platform level: 2 KTX Tracks

infra manager

- Through squeme
- New workshop adjacent to depot in service 2010
- Commercial center on top of the station

Commercial areas

Tracks	
Railway infra manager	KR
HS tracks yard	Through
Station location	At grade
Number of tracks	13
Tracks used for High speed	2
High Speed trains/day both ways	38
Length of platforms	

Areas	
Station footprint (sq mt)	70.000
Total area (sq mts)	
Platforms area (sq mt)	
Commercial area (sq mt)	
Number of Shops	
Offices area (sq mt)	
waiting area+pax services (sq mt)	
Parking area (sq mt)	

Depots	
Depot footprint (sq mts)	1.300.470
Daily movements st-depot	
Depot-station distance (Km)	17

Station construction costs (mill €)	

High Speed and the city
September 2010
Yongsan Station
Infra manager point of view
B.15.4

YONGSUAN:

Through operating scheme

along with a new design of the station platforms

Infrastructure Manager's viewpoint

PARIS CDG:

A totally New station

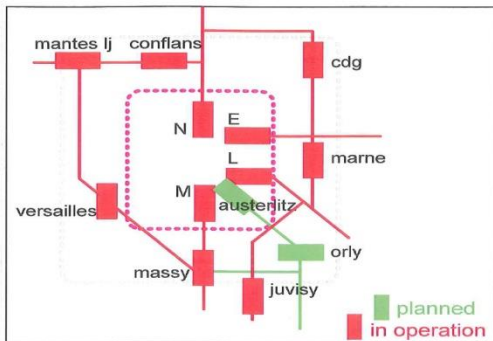


Platform level: 6 tracks used for HS

infra manager



- 6 high speed tracks; 2 of them through tracks



Commercial areas

Railway Infra manager		RFF
HS tracks yard		Through
Station location		Underground
Number of tracks		8
Tracks used for High speed		6
High Speed trains/day both ways		61
Length of platforms		480

Areas	
Station footprint (sq mt)	12.476
Total area (sq mts)	13.469
Platforms area (sq mt)	10.511
Commercial area (sq mt)	390
Number of Shops	2
Offices area (sq mt)	2.239
waiting area+pax services (sq mt)	5.198
Parking area (sq mt)	-

Depots	
Depot footprint (sq mts)	-
Daily movements st-depot	-
Depot-station distance (Km)	-

Station construction costs (mill €)	260
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High Speed and the city

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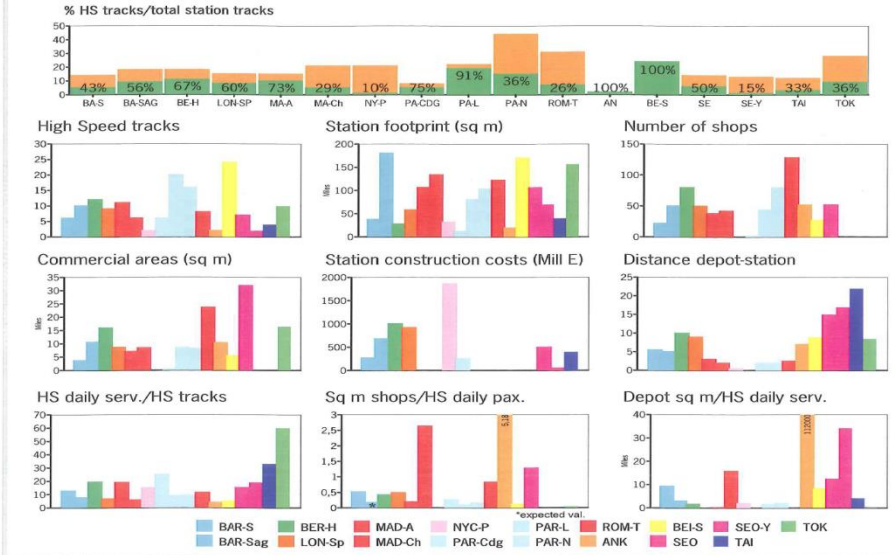
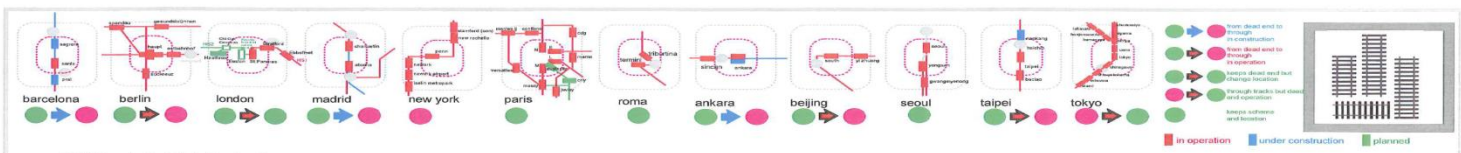
Paris-CDG
Infra manager point of view

B.8.4

Conclusion



Infrastructure Manager's viewpoint



■ **HS arrival has implied a restructuring of rail network achieving higher efficiency in all cases**

- most new HS lines are completely independent
- HS lines skip almost all stations of the conventional network
- change from dead end to through schemes in all but LON and PAR
- new depots and connections in almost all cases
- city terminals, new or remodelled with enhanced interchange with PuTr and commercial centers and offices, for city neighbours, not only for pax
- new HS stations outside the city, except MAD, in correlation with population and activity ratio region/ city, with extensive P&R

Conclusion



Both for the city and the station,
High Speed Rail
is seen as an opportunity and a potentiality.

Conclusion



In all the cases under review, HSR have brought huge changes at the city level.

Passengers,
operators,
infrastructure managers
and city planners
have benefited from the improvements.

Conclusion



These changes may sometimes occur in cities out of all High Speed context,...

... but the converse never happens:

HSR without any significant change.

Conclusion



Since there is a kind of causation effect between HSR implementation on one hand and the city and the station evolution on the other hand,...

... it is worth deepening this relationship in order to identify guidelines for further development of the HS network.

Thank you
for your attention

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