Company Profile and Development of Railway Services in Spain

Presentation to Ms. Janet Campbell-Lorenc. Senior Director NEC Business Development at AMTRAK
And Ms. Karen Hedlund. Acting Deputy Administrator of the Federal Rail Administration (FRA).
Spanish Railway Undertaking
RENFE-Operadora

• It is the main railway undertaking in Spain.
• It is a Government owned company.
• It is the only passenger operator on Spain’s National Railway Network (RFIG) and the main freight operator.
• At the end of 2012, RENFE-Operadora integrated the FEVE operations (another public entity that operated on narrow gauge lines, mainly in the north of Spain).

A Reference railway company
committed to quality service, security, profitability and sustainability
RENFE-Operadora organization

Four subsidiaries 100% owned by RENFE-Operadora

- **Passengers:**
  - High Speed
  - Long Distance
  - Regional
  - Commuter
  - Staff: 8,802

- **Freight & Logistic Services:**
  - Staff: 1,639

- **Manufacturing & Maintenance of Rolling Stock:**
  - Staff: 3,465

- **Renting of Rolling Stock:**
  - Developing

**Total Staff: 14,565**
Renfe Passenger

473 Million Passenger / year
21.33 Billion Passenger-Kms / year
96.28 % Punctuality
24 Complaints / 100,000 passengers
85.6 % PSI (Perceived satisfaction index)

1,355 Individual train sets
5,468 Train trips / day
185 Million Train-Kms annually
485 Stations Managed by Renfe
**Renfe International experience**

**Cross border operations**

![Map of rail routes](image)

4 main corridors

**Cooperation mainly with South America Railways**

**Active member in International Institutions**
- International Rail Transport Committee
- International Railway Union
- European Railway Undertakings and Infrastructure Managers
- International Association of Public Transport
- European Organization for Railway Transportation Enterprises and Service Providers
- European Centre for Public Enterprise and Public Services
- European organizations & European Railway Agency

**International training**

Russia, Turkey, Bosnia...
Committed to a strategy of internationalization

- Integration into consortia for the construction and operation of High Speed and Commuter services
- Rail services operation in liberalized markets
- Cooperation for the development of railways in third countries, especially in Latin America
International Development of Renfe. The Spanish Consortium Success in Saudi Arabia

RENFE leads the Spanish consortium Al Shoula Group (12 Spanish companies, and 2 local):

- Winner the contract for a total amount of € 6,736 M. (October 26, 2011)
- Track construction, installations and workshops
- 35 trainsets
- Operation for 12 years
- Maximum demand / day: ~ 160,000 passengers

450 km
5 Stations

International Airport

KAEC

JEDDAH

MAKKAH
Al Shoula Saudi – Spanish Consortium

HHR project: systems breakdown

Design & Project Management Plan: consultrans
Operation & Customer Commitment: renfe
Rolling Stock: Talgo
Telecommunications Operation Control Center: indra
Electrification: OHL
Signaling: INABENSA
Civil Works: IMATHIA
Systems Integration & Maintenance activities: COPASA

renfe
High Speed Railway Services
First, a successful experience: High Speed Madrid-Seville
The beginnings of high speed in Spain

GOVERNMENT DECISION - October, 1986

To build a new line Madrid-Seville (471 km):

- Three goals,
  - Less distance
  - Less travel time
  - More capacity

COMMERCIAL OPERATION - April, 1992

Five service factors:
  - Travel time
  - Comfort
  - Quality (on board and in stations)
  - Price
  - On-time commitment

1991
570 km / 5:10 h.

1992
471 km / 2:20 h.
The result of this success, a new modal distribution
Source of demand in Madrid-Seville corridor (first year results)

Transfer from other modes of transport less environmentally friendly

HS generates growth and creates jobs

- New Demand
- Conventional Train
- Car
- Airplane
- Bus

26%
24%
13%
34%
3%
High speed services. Renfe’s model

- Different approach than in other railway companies.
- Three distinct services using the same infrastructure:
  - Long Distance Commercial service: 2/3 classes
  - Regional Public service: Single class
  - Long Distance Dual Gauge Commercial service: 2 classes
Through our service “Atendo”, we guarantee the right to travel to people with reduced mobility

Through our service “Atendo”, we guarantee the right to travel to people with reduced mobility

Regional Trains

People with reduced mobility assisted in our trains:

AVE Class 102

More than 2,100,000 persons assisted since July 2007

Costumers satisfaction: 8.79
AVE club lounge

AVE CLUB LOUNGE

MODERNITY

COMFORT

DESIGN
AVE trains - service on board
High Speed - Long Distance
300/350 kph (186/218 mph)

Three classes
- High level of service
- Market price
- Profitable
- No government compensations

SUMMARY:
- 96 trainsets in operation
- 154 daily services
- 55,645 daily seats offered
**AVE class 100 R**

Manufactured by: ALSTOM  
(In operation since 1992)  
(Refurbished in 2007/2009)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge</td>
<td>1,435 mm</td>
</tr>
<tr>
<td>Maximum speed</td>
<td>300 kmh</td>
</tr>
<tr>
<td>Number of trains</td>
<td>24</td>
</tr>
<tr>
<td>Length</td>
<td>200 m</td>
</tr>
<tr>
<td>Number of seats</td>
<td>332</td>
</tr>
<tr>
<td>Number of seats for PRM</td>
<td>2</td>
</tr>
</tbody>
</table>
AVE class 100 R

Cafeteria

Tourist class

Class Club

Business class
AVE class 102 / 112

Manufactured by: TALGO
(In operation since 2005)

Gauge: 1,435 mm
Maximum speed: 330 kmh
Number of trains: 16 / 30
Length: 200 m
Number of seats: 316 / 365
Number of seats for people with reduced mobility (PRM): 2
AVE class 102 / 112

Cabin

Cafeteria

Club Class
AVE class 103

Manufactured by: SIEMENS
(In operation since 2007)

Gauge: 1,435 mm
Maximum speed: 350 kmh
Number of trains: 26
Length: 200 m
Number of seats: 405
Number of seats for people with reduced mobility (PRM): 2
AVE class 103

- Club Class
- Lounge Club & Cabin
- Business Class
- Cafeteria
- Tourist Class
High Speed - Regional
250 kph (155 mph)

- Public service fares, approved by the government
- Single class
- Functional train
- Financial compensations negotiated on a multi-year basis

SUMMARY:
- 62 trainsets in operation
- 95 daily services
- 27,130 daily seats offered
AVANT class 104

Manufactured by: ALSTOM
(In operation since 2004)

Gauge: 1,435 mm
Maximum speed: 250 kmh
Number of trains: 20
Length: 107 m
Number of seats: 237
Number of seats for people with reduced mobility (PRM): 1
AVANT class 114

Manufactured by: ALSTOM
(In operation since 2009)

Gauge: 1,435 mm
Maximum speed: 250 kmh
Number of trains: 13
Length: 105,5 m
Number of seats: 237
Number of seats for people with reduced mobility (PRM): 1
AVANT class 114

Interior details & cabin
AVANT class 121

Manufactured by: CAF
(In operation since 2009)

Dual Gauge: 1,435 mm
1,668 mm

Maximum speed: 250 kmh

Number of trains: 29

Length: 107.4 m

Number of seats: 281 Tourist

Number of seats for people with reduced mobility (PRM): 1
AVANT class 121

Interior details & cabin
**High Speed Dual Gauge Services**

- Speed 250 kmh using High Speed Lines.
- Up to 220 kmh using conventional lines.

- The Dual Gauge services extend the benefits of the high speed lines to conventional network
- Two classes
- Full service
- Market price
- Globally profitable

### Average service: 570 km (354 mi)

### SUMMARY:

- 73 trainsets in operation
- 75 daily services
- 20,061 daily seats offered
ALVIA class 120

Manufactured by: CAF
(In operation since 2006)

Dual Gauge: 1,435 / 1,668 mm
Maximum speed: 250 kmh
Number of trains: 28
Length: 107 m
Number of seats: 238
Number of seats for people with reduced mobility (PRM): 1
ALVIA class 120

Business Class

Cafeteria

Tourist Class
ALVIA class 130

Manufactured by: TALGO
(In operation since 2007)

Dual Gauge: 1,435 / 1,668 mm
Maximum speed: 250 kmh
Number of trains: 45
Length: 181 m
Number of seats: 299
Number of seats for people with reduced mobility (PRM): 1
Latest example of interoperability: ALVIA class 730 (Hybrid)

An evolution from Class 130: diesel traction added in order to improve interoperability.

Manufactured by: TALGO
(In operation since JUNE 17, 2012)

Dual Gauge: 1,435 / 1,668 mm
Maximum speed: 250 kmh at 25 kV AC 50 Hz
220 kmh at 3 kV DC
180 kmh with diesel power supply
Number of trains: 15
Length: 186 m
Number of seats: 265 (49 business + 216 tourist)
Trainsets: Single or multiple unit configuration (single unit = 2 Powerheads + 11 coaches)

OPERATION MODES:
1. Electrical mode
   • 25 kV AC 50 Hz – 4,800 kW installed
   • 3 kV DC – 4,000 kW
2. Diesel mode
   • Two diesel-electric generators with 3 kV voltage output – 1,800 kW at 1,800 rpm each.
ALVIA class 130

Tourist Class

Cabin

Cafeteria

Business Class
# The High Speed fleet in Spain
## MAIN FIGURES

<table>
<thead>
<tr>
<th>HIGH SPEED SERVICES:</th>
<th>CURRENT FLEET</th>
<th>TRAINS / DAY (Average)</th>
<th>SEATS / DAY (Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONG DISTANCE</td>
<td>96</td>
<td>154</td>
<td>55,645</td>
</tr>
<tr>
<td>REGIONAL</td>
<td>62</td>
<td>95</td>
<td>27,130</td>
</tr>
<tr>
<td>DUAL GAUGE</td>
<td>73</td>
<td>75</td>
<td>20,061</td>
</tr>
<tr>
<td>Total:</td>
<td>231</td>
<td>324</td>
<td>102,836</td>
</tr>
</tbody>
</table>
# Renfe’s High Speed Rolling Stock Fleet

<table>
<thead>
<tr>
<th>L O N G</th>
<th>D I S T A N C E</th>
<th>R E G I O N A L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Gauge</td>
<td>Dual Gauge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLASS</td>
<td>100 R</td>
<td>102 / 112</td>
</tr>
<tr>
<td>MANUFACTURER</td>
<td>Alstom</td>
<td>Talgo</td>
</tr>
<tr>
<td>UNITS</td>
<td>24</td>
<td>16 / 30</td>
</tr>
<tr>
<td>MAXIMUM SPEED</td>
<td>300 (186)</td>
<td>330 (205)</td>
</tr>
<tr>
<td>SEATS</td>
<td>332 (2 PRM)</td>
<td>316 (2 PRM)</td>
</tr>
<tr>
<td>GAUGE</td>
<td>1,435 mm.</td>
<td>1,435 mm.</td>
</tr>
<tr>
<td>TOTAL FLEET:</td>
<td>231 TRAINSETS</td>
<td></td>
</tr>
</tbody>
</table>

Integration of Different Technologies
Passenger numbers evolution (only pure high speed services)
Air - Rail Demand in Main Corridors
Market share Madrid - Seville

APRIL 21, 1992
THE FIRST HIGH SPEED SERVICE ARRIVES IN SEVILLE
Market share Madrid - Malaga

DECEMBER 27, 2007
THE NEW HIGH SPEED SERVICE ARRIVES IN MALAGA
Market share Madrid - Barcelona

FEBRUARY 20, 2008
THE NEW HIGH SPEED SERVICE ARRIVES IN BARCELONA
Market share Madrid - Valencia

ON DECEMBER 19, 2010
THE NEW HIGH SPEED SERVICE ARRIVES IN VALENCIA

PASSENGERS: Madrid - Valencia

<table>
<thead>
<tr>
<th>Year</th>
<th>PLANE</th>
<th>TRAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>1,023,555</td>
<td>756,554</td>
</tr>
<tr>
<td>2011</td>
<td>444,863</td>
<td>1,760,290</td>
</tr>
<tr>
<td>2012</td>
<td>271,908</td>
<td>1,655,146</td>
</tr>
<tr>
<td>2013</td>
<td>55,538</td>
<td>1,762,603</td>
</tr>
</tbody>
</table>

Market Share 2013 | 12,57% | 87,43%
Commitment to quality
1st Stage: high speed punctuality commitment

- **Date**: September 11, 1994
- **Product**: High Speed Trains

- **Commitment**: Total ticket price refunded if a train arrives in its destination with a delay of five minutes or more. The price is refunded in cash.
2\textsuperscript{nd} Stage: new quality commitments

Gradual implementation of the on-time commitment to other products:
- Long Distance
- Regional

RENFE-Operadora undertakes further quality commitments:
- Video / Audio, Air-conditioning, WC,
- Meal service at seat, Restaurant/cafeteria

Success of on-time commitment for AVE trains led to:

<table>
<thead>
<tr>
<th>Lack / deficiency of:</th>
<th>% refund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video / Audio</td>
<td>15%</td>
</tr>
<tr>
<td>Air conditioning (total)</td>
<td>100%</td>
</tr>
<tr>
<td>Air conditioning (partial)</td>
<td>50%</td>
</tr>
<tr>
<td>Toilet</td>
<td>100%</td>
</tr>
<tr>
<td>Meal service at seat</td>
<td>50%</td>
</tr>
<tr>
<td>Bistro / Restaurant</td>
<td>25%</td>
</tr>
</tbody>
</table>

Compensations for lack or deficiency in services
## Punctuality evolution (%)

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commuter trains</td>
<td>96.63</td>
<td>97.44</td>
<td>97.38</td>
<td>97.59</td>
<td>97.97</td>
<td>97.68</td>
</tr>
<tr>
<td>Regional conventional</td>
<td>91.56</td>
<td>92.60</td>
<td>92.29</td>
<td>93.76</td>
<td>86.37</td>
<td>82.14</td>
</tr>
<tr>
<td>High Speed regional</td>
<td>99.03</td>
<td>97.48</td>
<td>95.58</td>
<td>96.72</td>
<td>96.49</td>
<td>96.23</td>
</tr>
<tr>
<td>High Speed long distance</td>
<td>97.44</td>
<td>96.87</td>
<td>93.83</td>
<td>94.12</td>
<td>94.25</td>
<td>92.71</td>
</tr>
<tr>
<td>Long distance conventional</td>
<td>80.16</td>
<td>83.85</td>
<td>79.92</td>
<td>84.36</td>
<td>86.24</td>
<td>80.78</td>
</tr>
<tr>
<td>Overall punctuality of passenger services</td>
<td>95.44</td>
<td>96.19</td>
<td>95.73</td>
<td>96.28</td>
<td>96.33</td>
<td>94.92</td>
</tr>
</tbody>
</table>

_Punctuality defined as within 3 minutes of advertised arrival time._
We have satisfied customers and we keep them satisfied year after year

First High Speed Line Madrid - Seville
Satisfaction after 20 years of operation.
(Average 8.1)

<table>
<thead>
<tr>
<th>Satisfied</th>
<th>Very satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>64.9%</td>
<td>33.0%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Latest High Speed Line Madrid - Barcelona
Satisfaction after six year of operation.
(Average 8.3)

<table>
<thead>
<tr>
<th>Satisfied</th>
<th>Very satisfied</th>
<th>Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>62.4%</td>
<td>36.8%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Source: Annual study of AVE products - 2012 by passenger business area of Renfe
Commuter Services.
Basic Service Description
## Main Information of Commuter Services - 2012

### Cercanías

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers/workday</td>
<td>1,452,124</td>
</tr>
<tr>
<td>Stations</td>
<td>540</td>
</tr>
<tr>
<td>Stations managed by RENFE</td>
<td>488</td>
</tr>
<tr>
<td>Trains/workday</td>
<td>3,704</td>
</tr>
<tr>
<td>Services over</td>
<td>2,201 km / Tracks</td>
</tr>
</tbody>
</table>
Commuter Areas

- MADRID: 815,261 passengers, 44 trains
- ASTURIAS: 21,736 passengers, 171 trains
- SANTANDER: 3,745 passengers, 44 trains
- BILBAO: 45,865 passengers, 327 trains
- S. SEBASTIAN: 24,632 passengers, 82 trains
- BARCELONA: 378,763 passengers, 847 trains
- VALENCIA: 69,934 passengers, 356 trains
- MURCIA-ALICANTE: 17,048 passengers, 111 trains
- CÁDIZ: 12,337 passengers, 78 trains
- SEVILLA: 32,824 passengers, 198 trains
- MÁLAGA: 28,821 passengers, 132 trains

AVERAGE:
- Passengers per day
- Trains per day
Class 442

Class 446/447

Class 450/451

Cercanías

* Class 450 counted as 2 UT’s

Class 442

Clase 592

Class 446/447

Class 450/451

Cvia
Modularity - 446 / 447

Cercanías

234 seats
468 standing places
TOTAL: 702

+  

234 seats
468 standing places
TOTAL: 702

=  

468 seats
936 standing places
TOTAL: 1,404
Modularity - Civia trains

- Class 465: 277 seats, 720 standing places, TOTAL: 997
- Class 464: 223 seats, 579 standing places, TOTAL: 802
- Class 463: 169 seats, 438 standing places, TOTAL: 607
- Class 462: 126 seats, 288 standing places, TOTAL: 414
Embajadores (Madrid)

Development of Commuter Stations
Station Spaces for Commuter Trains. Identity, Architecture and Design.
• FUNCTIONALITY AND TECHNOLOGY
• INTERMODALITY OF TRANSPORT MEANS
• INTEGRATION IN THE URBAN ENVIRONMENT

Cercanías

Getafe (Madrid)
GADES PLAN  (Gestión automatizada de estaciones)  
(Automatic management of stations)

Equipping the stations with centralized and integrated systems for making easier the passenger management and control

**Environment**
- Station Systems.
- Communication Systems.
- CIC (Commuter Trains Information Center).
BIOCLIMATIC STATIONS:

Rubí and San Cugat stations, in Barcelona, are the first bioclimatic Renfe stations. This pilot experience is integrated in a plan based in the principles of sustainable architecture.
Regional Services
**Main Information of Regional Services**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers/Day</td>
<td>99,213</td>
</tr>
<tr>
<td>Stations</td>
<td>945</td>
</tr>
<tr>
<td>Trains/Working Day</td>
<td>679</td>
</tr>
<tr>
<td>Services over</td>
<td>10,386 km / Tracks</td>
</tr>
</tbody>
</table>
Territorial Unfolding of Regional Services
Current fleet of Conventional Regional Trains

Class 440/470 (*) - 448

Class 592/596 (*)

(*) Commuter trains adapted for Regional Services.

Class 598

Class 594

Class 449

Class 599

85*

40*

20

23

57

50
Tourist trains
Luxury Trans-Cantábrico Train
Luxury Trans-Cantábrico Train
Luxury Trans-Cantábrico Train
Classic Trans-Cantábrico Train
Classic Trans-Cantábrico Train
Classic Trans-Cantábrico Train
Al Ándalus Train
Al Ándalus Train
Al Ándalus Train
Al Ándalus Train
Expreso de la Robla Train
Expreso de la Robla Train
North’s tourist train
North’s tourist train
Renfe’s Rolling Stock Manufacture and Maintenance
Current strategies

STRATEGIES:

- Establish **alliances** with the private sector, both for the manufacture of trains and for internal and external maintenance.
- **Technological update** of Renfe-Operadora depots.
- **Modernization and upgrading** of installations.

### CONVENTIONAL ROLLING STOCK:

- Maintenance .......... 100%
- Refurbishment ......... 100%

### NEW ROLLING STOCK:

- (High Speed, Long Distance, Regional, Commuters)
  - Manufacture .......... 20%
  - Maintenance .......... 50%
Renfe Rolling Stock Manufacturing & Maintenance

56 Workshops

46 Technical Assistance Depots

7 Specialized Components Repair Plants

Wide experience with Rolling Stock from all main manufacturers
Join Venture with CAF, Alstom, Siemens, Vossloh and Bombardier
Joint ventures Renfe - private sector

- Siemens Renfe: March 2002
- Vossloh Renfe: January 2007
- CAF Renfe: May 2007
- Bombardier Renfe: November 2007
- Alstom Renfe: January 2008
- Talgo Renfe: June 2008 until March 2013
- Irvia: February 2002 until September 2013
Thank you for your attention.