TALGO IN AMERICA: THE BEST IS YET TO COME

Content

Part I

- Why Rail is needed now more than ever
- Who we are, what we do
- Talgo High Speed Rail products
- How Talgo ended up in Washington State
- The incremental approach experience in the USA
- Why choose Talgo?

Part II

- Lessons we can learn from Spain High Speed Rail Development

Why rail is needed more than ever?

- Safety
- Oil consumption
- Environment
- Security and energy independence
- Congestion
- Efficient

Talgo

Safety

- 6 million (2006 data) annual highway wrecks
- Injure 2.5 million people
- And kill 42,600 (about 117 people per day)

How does rail compare?

SAFE

Fatality rate per billion passenger miles traveled

Car (most dangerous) 7.2

Airplane 2.3

Bus 2.0

Train (safest) 0.5

http://airfare.michaelbluejay.com/modes.html#pm

Transportation Accidents[a] by Mode	
	1999
Air	
U.S. air carrier[b]	52
Commuter carrier[c]	13
On-demand air taxi[d]	76
General aviation[e]	1,909
Highway	
Passenger car	4,916,000
Motorcycle	57,000
Truck[f]	3,425,000
Bus	63,000
Total highway crashes[a]	**6,279,000**
Rail	
Highway-rail grade crossing[g,h]	3,489
Railroad[g,I]	2,768
Transit[j]	**23,416**
Waterborne	
Vessel-related	3,654
Recreational boating	7,935
Pipeline	
Hazarous liquid pipeline	165
Gas pipeline	174
TOTAL accidents	**6,330,000**

http://www.bts.gov/publications/national_transportation_statistics/2000/html/2-3.htm

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What does it take to move one person one mile?

Rail is *17%* more efficient than domestic airline travel

Rail is *21%* more efficient than automobile travel

All measures are in British Thermal Units of energy per passenger mile

All data as of 2005; U.S. DoE, "Transportation Energy Data Book," 26th Edition

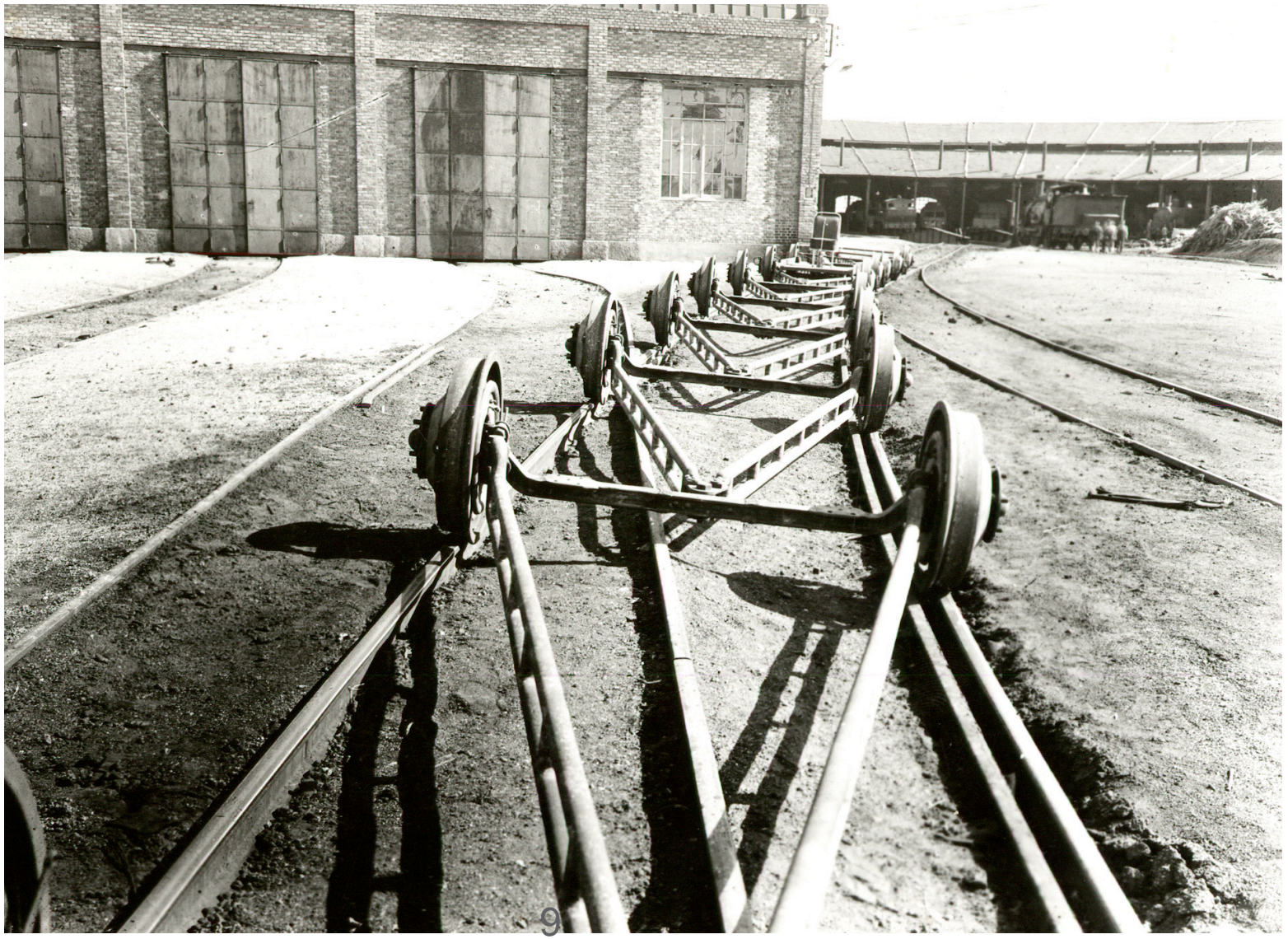
The reason for the efficiency is

Talgo

Less land dedicated to transportation

Talgo

IT ALL STARTED...



TALGO COMPANY

Profile

Year established:	1942
Employees in 2007:	1,120
Revenues 2007	$ 394.5 (million)

History

- Over 60 years in business
- Over 3,000 vehicles built
- High speed applications
- Built in the U.S. in 1950's
- Continuous service in the U.S. since 1994
- Safety record (accidents demonstrated crashworthiness; minimal injuries/deaths)

Core Business

Design, Manufacture , Maintenance of

- Passenger Trains
- Maintenance Equipment
- Automatic Dual Gauge System

Talgo

TALGO WORLDWIDE

Products

Talgo's main products consist of a variety of High Speed and Intercity trains

Main Products

Talgo AVE 330

Commissioning year:	2004
Maximum speed:	330 Km/h
No. of cars per train:	12
No. of cars in circulation:	180
Market segment:	High Speed

Talgo S7 Intercity

Commissioning year:	1998
Maximum speed:	250 Km/h
No. of cars per train:	11
No. of cars in circulation:	333
Market segment:	Intercity

Talgo 200 S6

Commissioning year:	1990
Maximum speed:	200 Km/h
No. of cars per train:	variable
No. of cars in circulation:	388
Market segment:	Intercity

Talgo S3 – S5

Commissioning year:	1964 - 1981
Maximum speed:	160 - 180 Km/h
No. of cars per train:	variable
No. of cars in circulation:	443
Market segment:	Intercity

Main Products

Double Decker Intercity

Commissioning year:	1998
Maximum speed:	200 Km/h
No. of cars per train:	variable
No. of cars in circulation:	92
Market segment:	Intercity

Prototypes

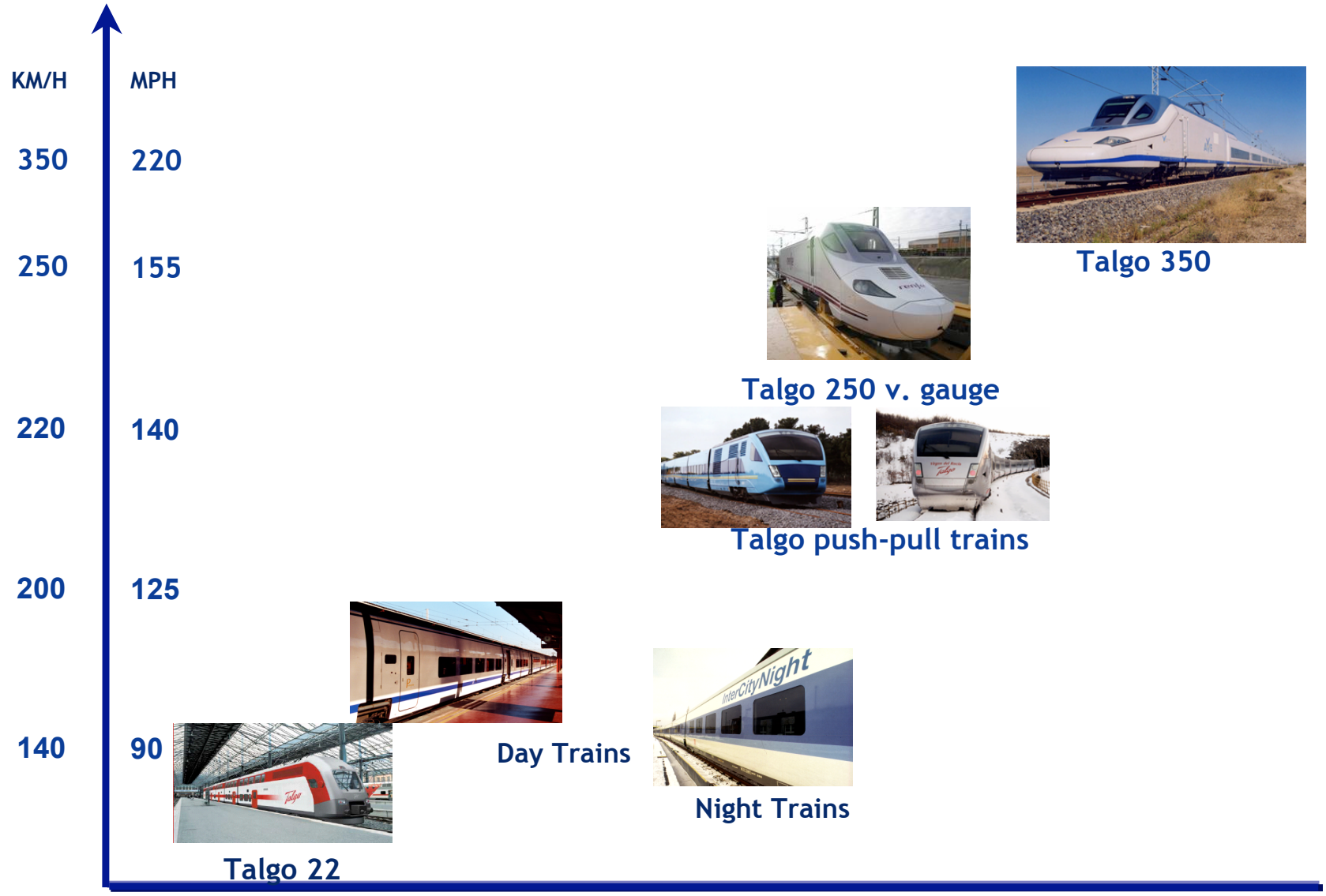
Talgo 22

Commissioning year:	In progress
Maximum speed:	160 Km/h
No. of cars per train:	variable
No. of cars in circulation:	-
Market segment:	Regional

TRAVCA Loco

- AV Locomotive with track width change
- Jointly developed with TEAM
- Testing stage (€6 million R&D)
- Possibility to export to countries with different track width change

TALGO PRODUCTS



Talgo 350

- max speed= 220 mph
- seats = 348-500
- weight = 290-320 t
- length = 660-1310 ft
- aluminum body shell
- articulated train

BISTRO AND RESTAURANT SERVICE

Cafeteria Car

- Galley in Club Class
- Galley in Business Class
- Galley in Coach Class

INFORMATION AND ENTERTAIMENT

Passenger information system:

- Exterior panels
- Interior panels
- Information screens
- Selective public address system

- 4 stereo music channels individually selectable at seat (plus the audio of the video system)
- 3 video channels (DVD) with LCD screens

SEATS

Rotating and reclining seats in all classes

Seat pitch:

- Business Class: 39.50 in
- Coach Class: 39.50 in
- Club Class: 40.07 in

Talgo

Interior Design

Passenger cars

INTERIOR

Lavatory module

Bistro

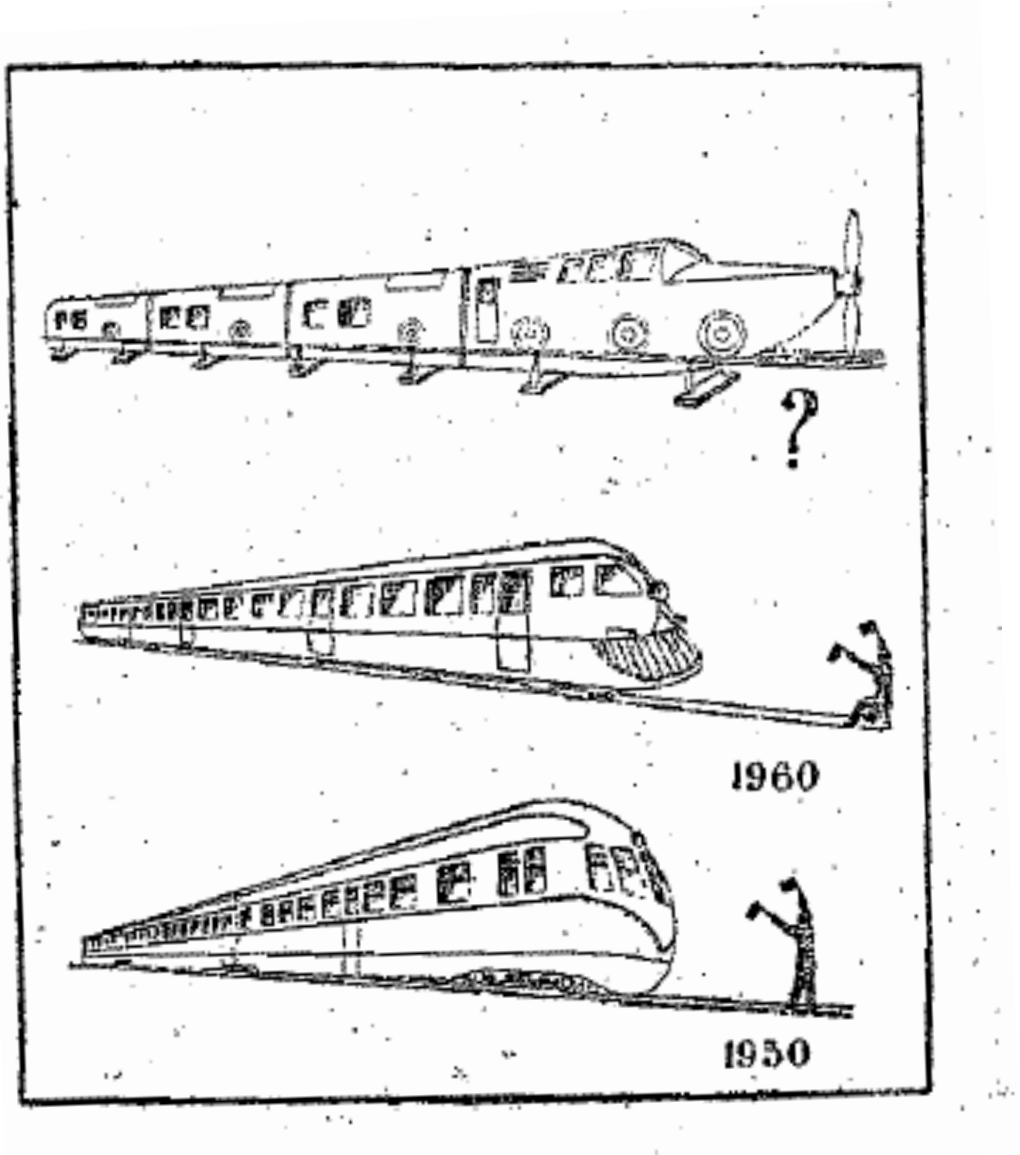
In Search of a Market with Potential: Talgo identified USA

+	-
Developed country	No HSR technology
Rail development abandoned in the 50's	No High speed trains
Population growing	Rail development abandoned in the 50's
Demanding public	No funds for Rail
No infrastructure for High Speed Rail	No brand recognition of HSR
Certain States with Rail Plans	

Why Washington State / Why Talgo

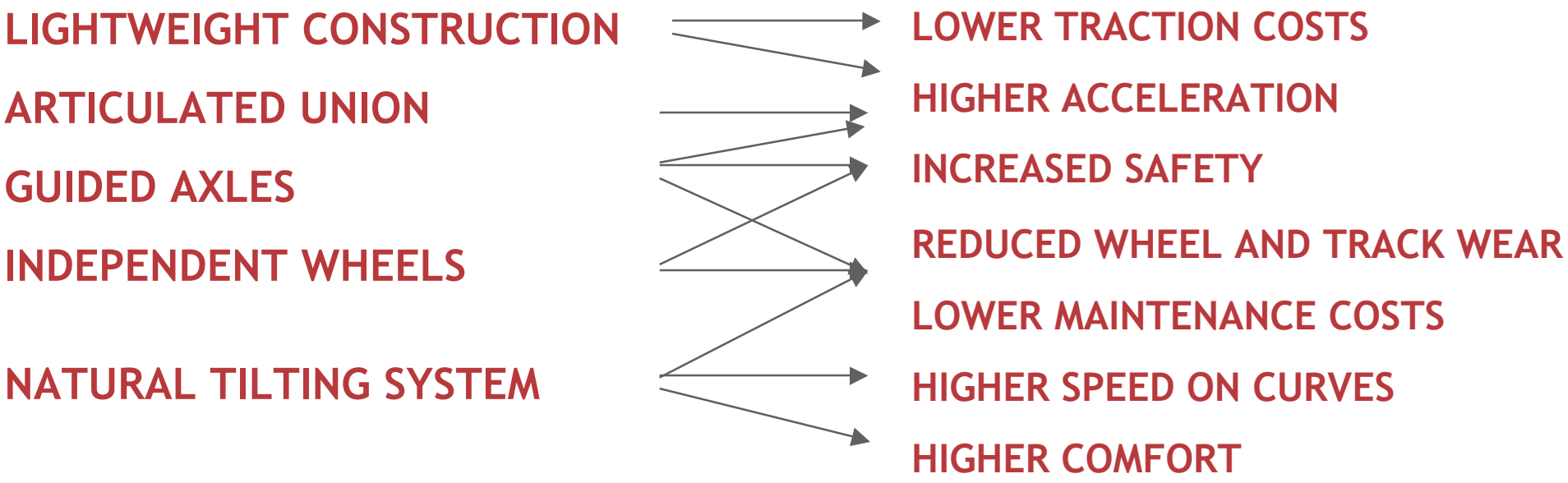
- 1991 legislation directed Washington State Department of Transportation to study the feasibility of a high speed ground transportation system.
- In 1992 Washington State became one of the original five federally designated high speed rail corridors.
- By 1993, Washington State had been exploring high speed rail for ten years.
- The corridor planning activity developed a performance specification for the type of trains that would be necessary to successfully implement an economical high sped rail plan.
- Talgo had the product that matched the specification.

Why Talgo?
The Vision



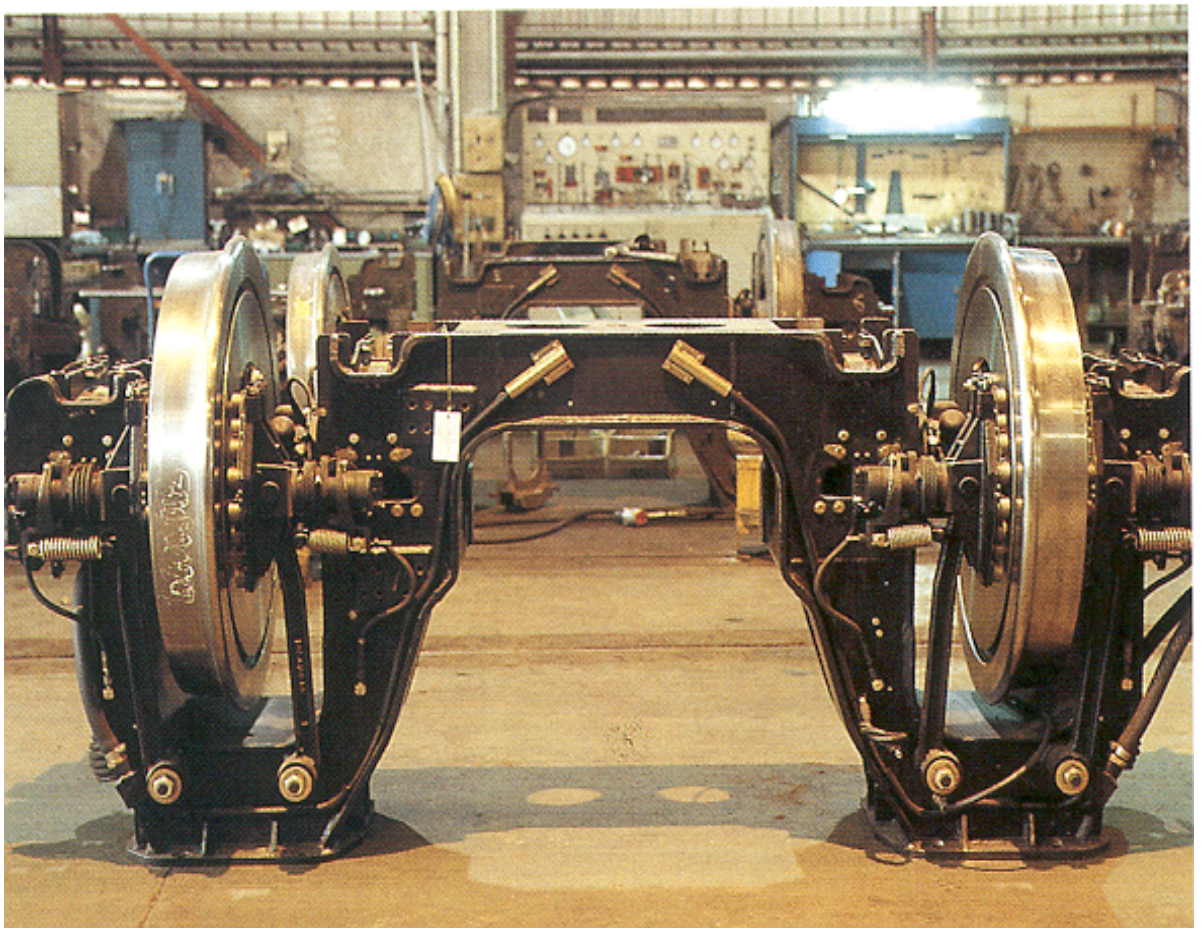
TECHNOLOGICAL PRINCIPLES OF THE TALGO TRAINS

Advantages of the Talgo trains



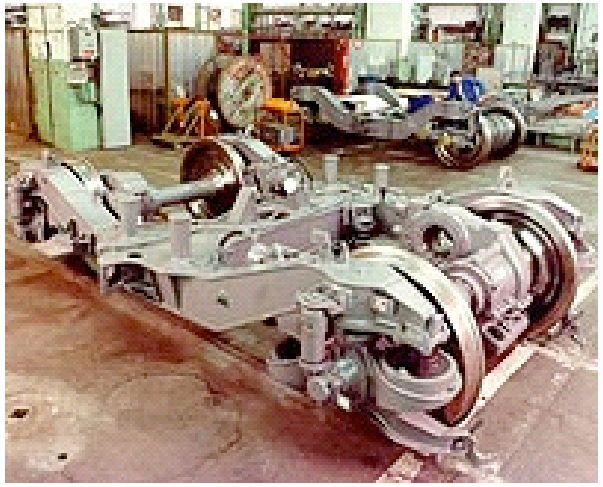
TECHNOLOGY

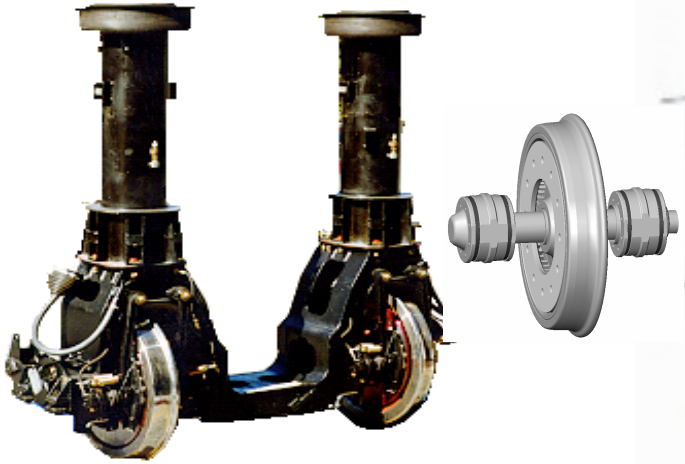
Independent and guided wheels (I)



TECHNOLOGY

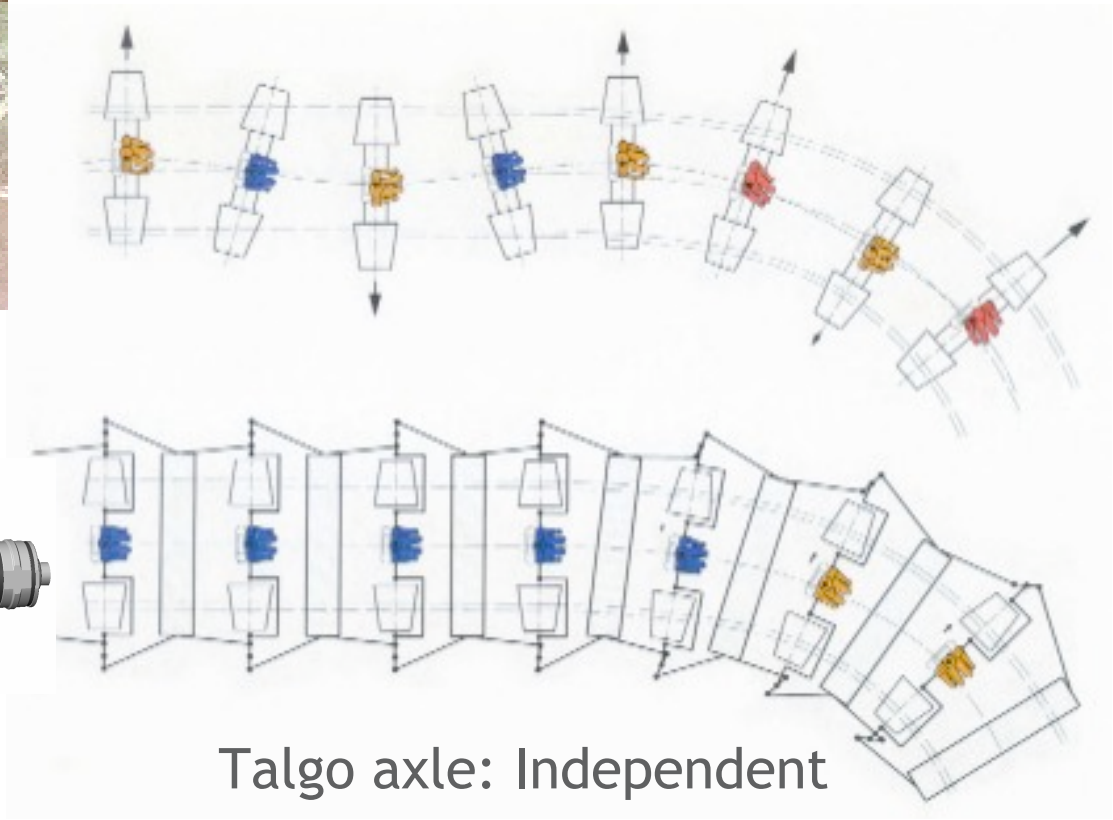
Independent and guided wheels (II)





Conventional axles:

Yaw movement

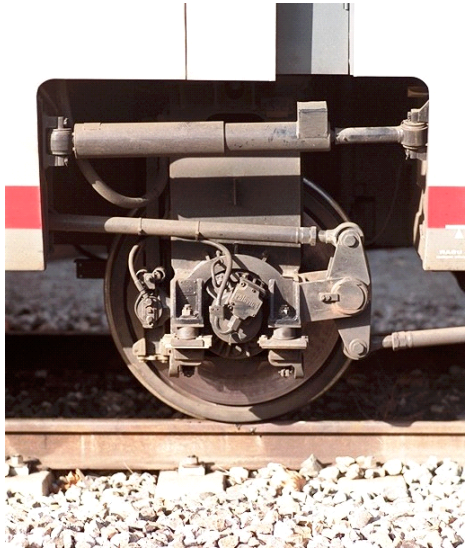


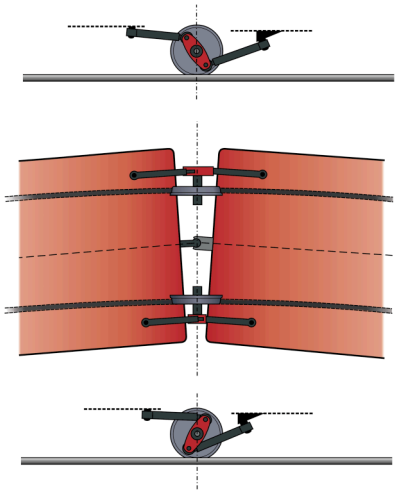
Talgo axle: Independent and guided wheels

TECHNOLOGY

Independent and guided wheels (III)

Talgo wheelset = Perfect wheel-track alignment



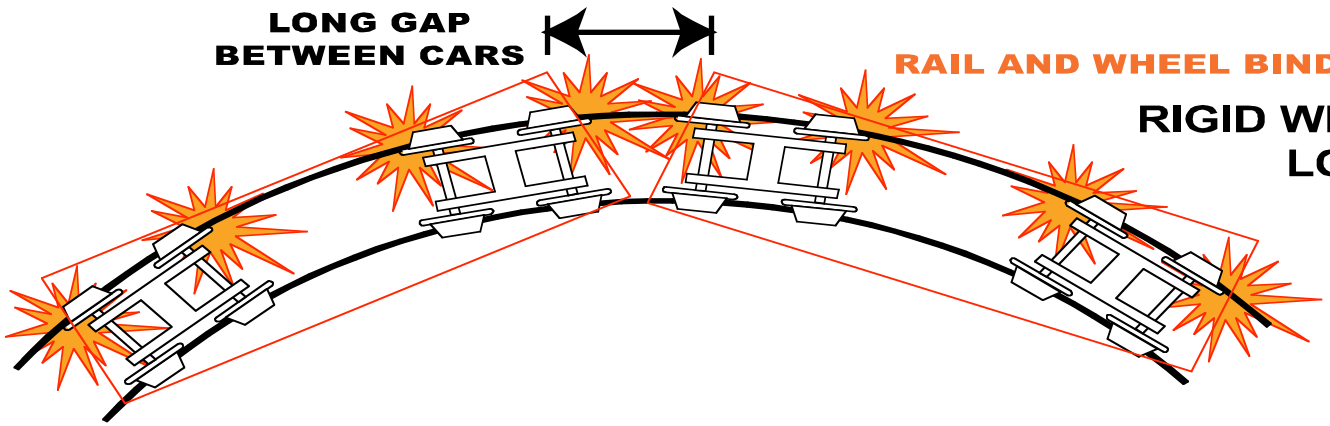


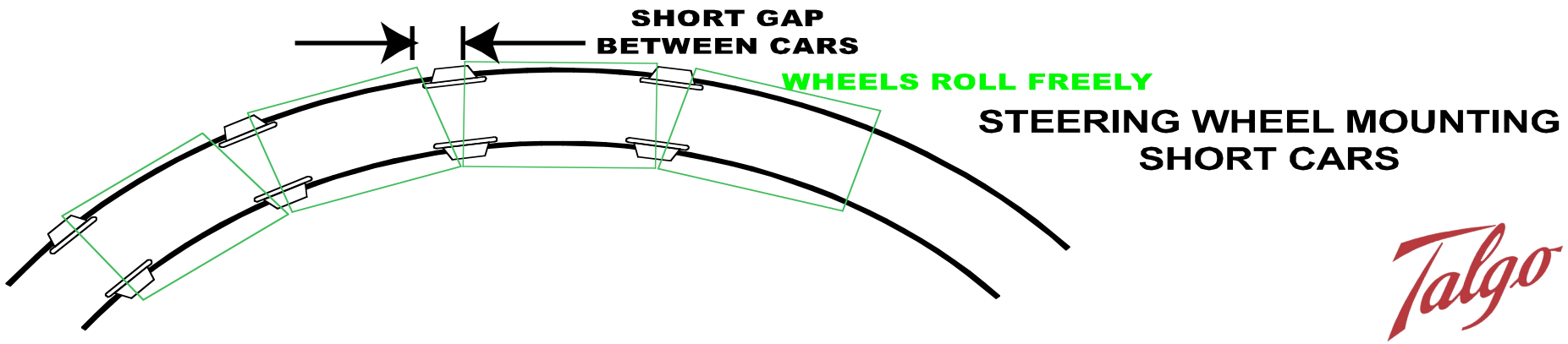
Main advantages:

- High running comfort
- Lower wheel and track wear (lower maintenance costs)
- No yaw movement
- Security against derailing

More advantages for today and tomorrow

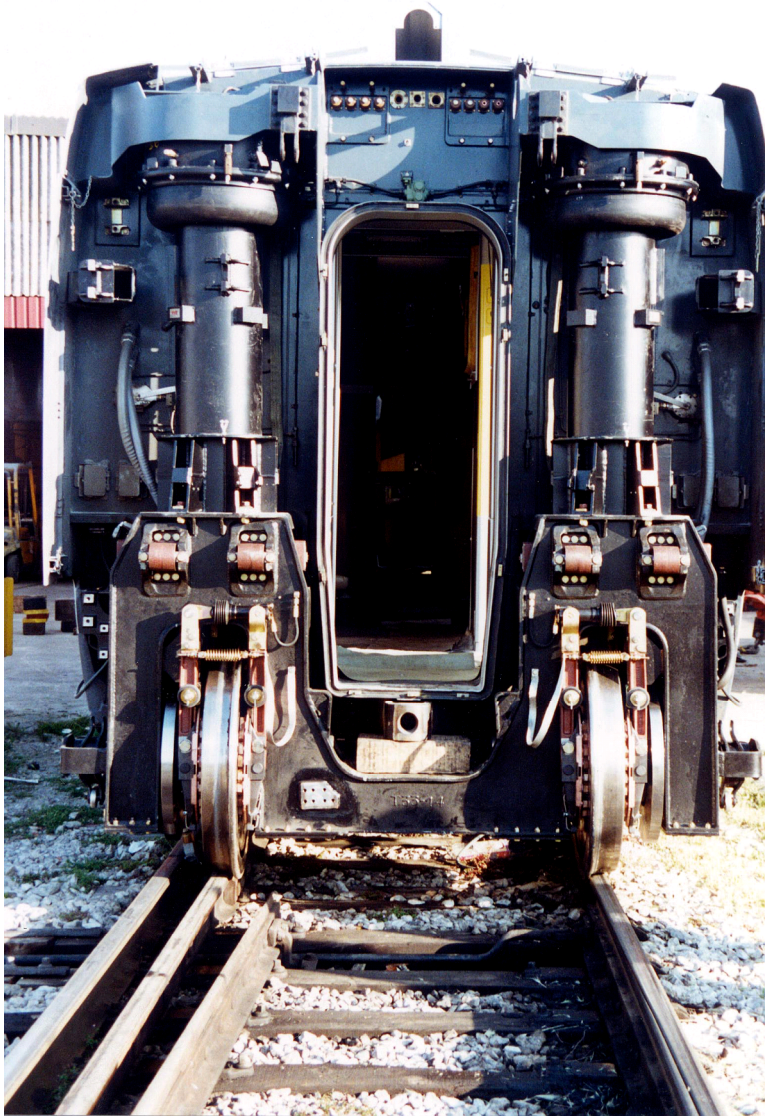
- Talgo's unique guiding system allows the wheels to remain parallel with the rail through curves, reducing wear on the rail and wheels and reducing friction that must be overcome by fuel consumption.





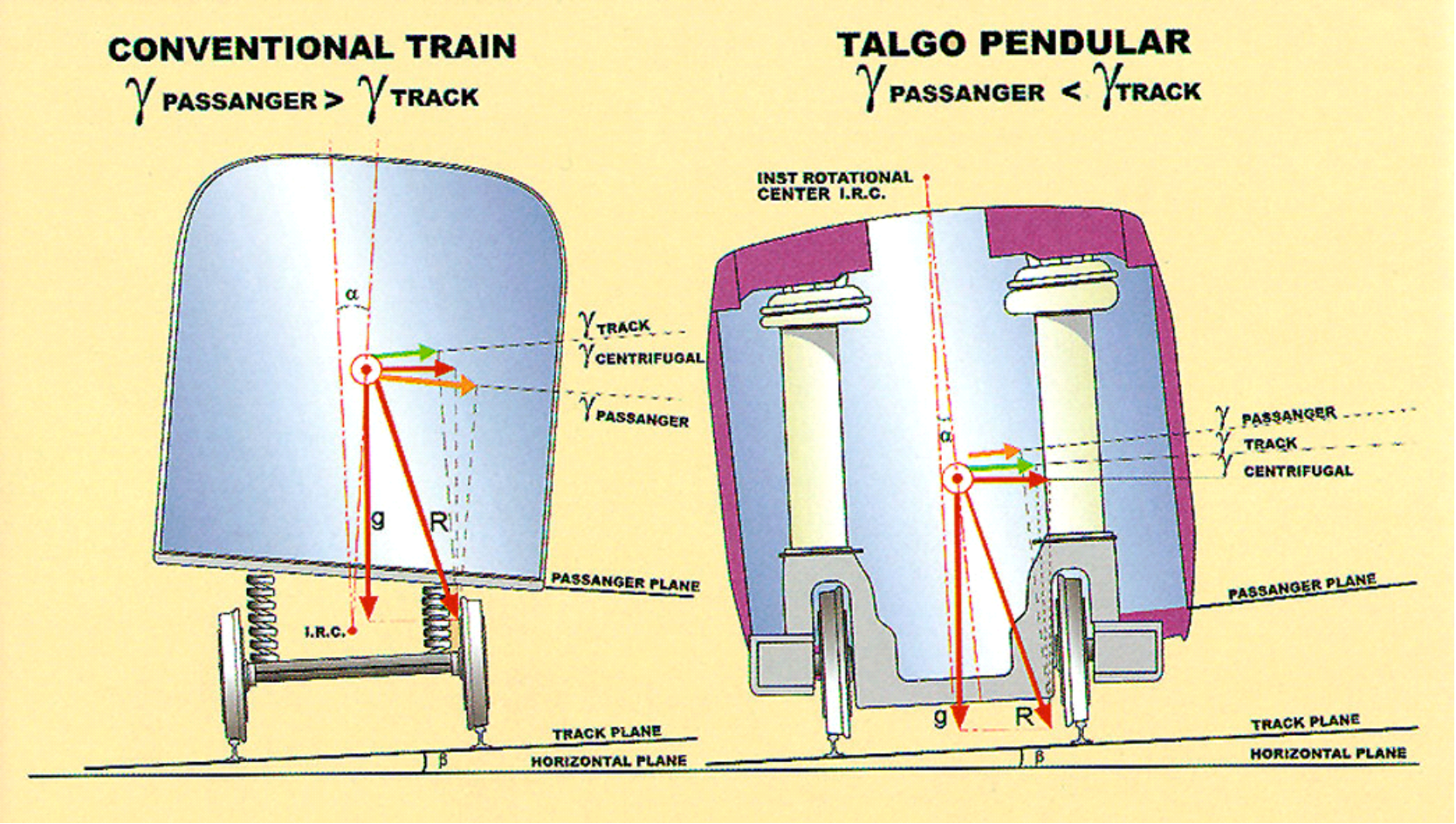
TECHNOLOGY

Natural tilting system (I)



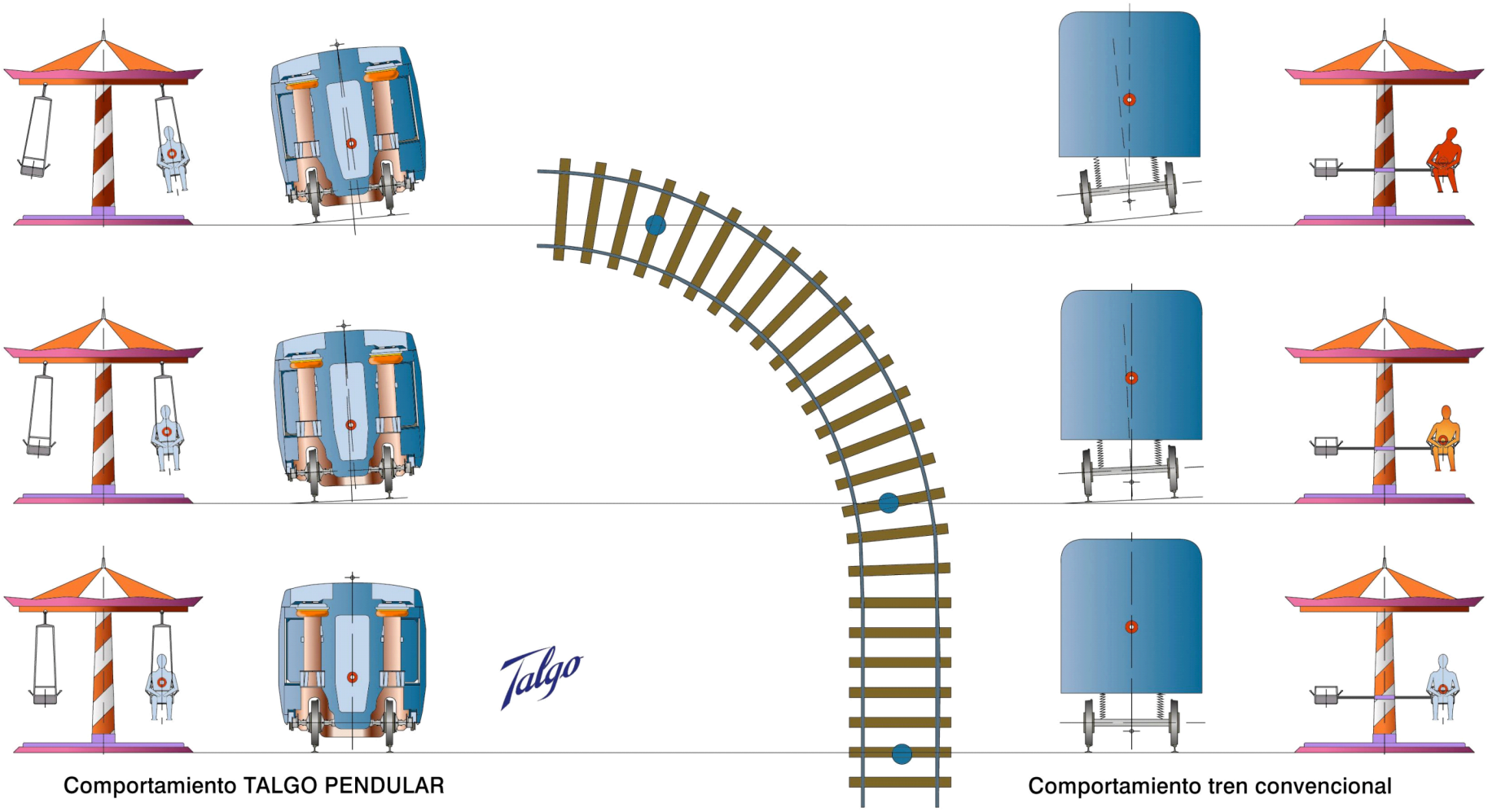
TECHNOLOGY

Natural tilting system (II)



TECHNOLOGY

Natural tilting system (III)



How does Talgo technology affect the Amtrak Cascades service now?

…through a combination of tilting and light weight

- Tilting allows faster speed through curves. 25% of the track between Vancouver BC and Portland is curved track that will limit the speed of conventional trains.
- The longest stretch of tangent track on the corridor is 9.2 miles.
- 32% of the corridor is segments of tangent track that are 2.3 miles in length or less, an insufficient length for useful acceleration of a conventional train.
- Between Seattle and Portland, about half of the travel time reduction is due to tilting and half is due to the ability to accelerate between restricted curves.
- The combination of tilting and light weight allows maximum utilization of existing infrastructure.

Talgo

- At high speeds, friction between the air and the sides of the train is an important resistance that must be overcome by power. The most effective high speed train design has closely coupled cars with minimum space between them for the air to catch, and a minimum surface area.

Why Incremental?

- Three reports completed in 1992 examined the alternatives for new high speed rail lines using the most advanced technologies, improving existing service incrementally, and improving existing service incrementally with a goal of speeds up to 125 mph.
- Reports by the US General Accounting Office and the Federal Railroad Administration confirmed the WSDOT finding that an entirely new alignment for latest-technology high speed rail would cost **ten to twenty times the cost** of 110 mph to 125 mph incremental improvement.

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Why 110 mph?

- 1993 legislation directed WSDOT to develop a high speed ground transportation program that had goals including top speeds of over 150 mph, incremental improvement, and an immediate objective of two hours thirty minutes between Seattle and Portland.
- Intermediate stations in the corridor are important and present significant ridership potential.
- Further study determined that there was a limited distance between station stops at which trains could operate at over 110 mph. A maximum speed of 125 mph would cost at least an additional **$500 MILLION** in capital and a substantial increase in operating cost for a schedule reduction of **TWO MINUTES** from a 110 mph schedule unless intermediate stations were eliminated.

THE INCREMENTAL APPROACH

WSDOT LONG RANGE PLAN

Amtrak *Cascades* Daily Roundtrip Trains

Total Trains	1994	2003	Mid-point	2023
Portland, OR to Seattle, WA	1	3	8	13*
Seattle, WA to Vancouver, BC	0	2**	3	4

**Includes three trains which travel north, beyond Seattle, to Vancouver, BC.*

***Amtrak Cascades #513/516 travels between Seattle and Bellingham.*

Amtrak *Cascades* Travel Times

Destination	1994	2003	Mid-point	2023
Portland, OR to Seattle, WA	3:55	3:30	3:00	2:30
Seattle, WA to Vancouver, BC	N/A	3:55*	3:25	2:37
Vancouver, BC to Seattle, WA to Portland, OR	N/A	N/A	6:40	5:22

**Travel time for train #510/517.*

Source for Exhibits 3-1 & 3-2: *Amtrak Cascades Timetable Effective October 27, 2003, and Amtrak Cascades Operating and Infrastructure Plan Technical Report, 2004.*

Passive-Tilt Trainsets for Amtrak *Cascades* Service between Portland, OR, Seattle, and Vancouver, BC

Service Year or Timetable	Required Number of Trainsets
2003	4
A	5
B	6
Mid-Point (C)	7*
D	9*
E	11**
2023 (F)	13***
Spare Sets (See Notes)	2

*Notes: *includes one spare set*
***includes two spare sets*
****includes three spare sets*

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CHRONOLOGY OF SIGNIFICANT DEVELOPMENTS

1949 First Talgo trains built in the U.S.

1988 Test runs in the Northeast Corridor

1994 WSDOT leases one Talgo trainset

1996 WSDOT and Amtrak buy four trainsets

1998 Amtrak Cascades service launch

1999 Structural static testing done in Pueblo, CO

1999 20-Year maintenance contract signed

2003 WSDOT buys fifth Talgo trainset

Talgo running in Pacific Northwest Corridor

Route map

Distance	Station	
0	Vancouver	
	Canada/U.S. border	
62 mi (100 km)	Bellingham	
88 mi (142 km)	Mount Vernon	
123 mi (198 km)	Everett	
139 mi (224 km)	Edmonds	
157 mi (253 km)	Seattle	Passengers change trains here
11 mi (18 km)	Tukwila	Distance from Seattle
39 mi (63 km)	Tacoma	
75 mi (121 km)	Olympia-Lacey	
94 mi (151 km)	Centralia	
137 mi (220 km)	Kelso	
177 mi (285 km)	Vancouver	
	Washington/Oregon border	(Columbia River)
187 mi (301 km)	Portland	
	Steel Bridge	(Willamette River)
202 mi (325 km)	Oregon City	
239 mi (385 km)	Salem	
267 mi (430 km)	Albany	
310 mi (499 km)	Eugene	

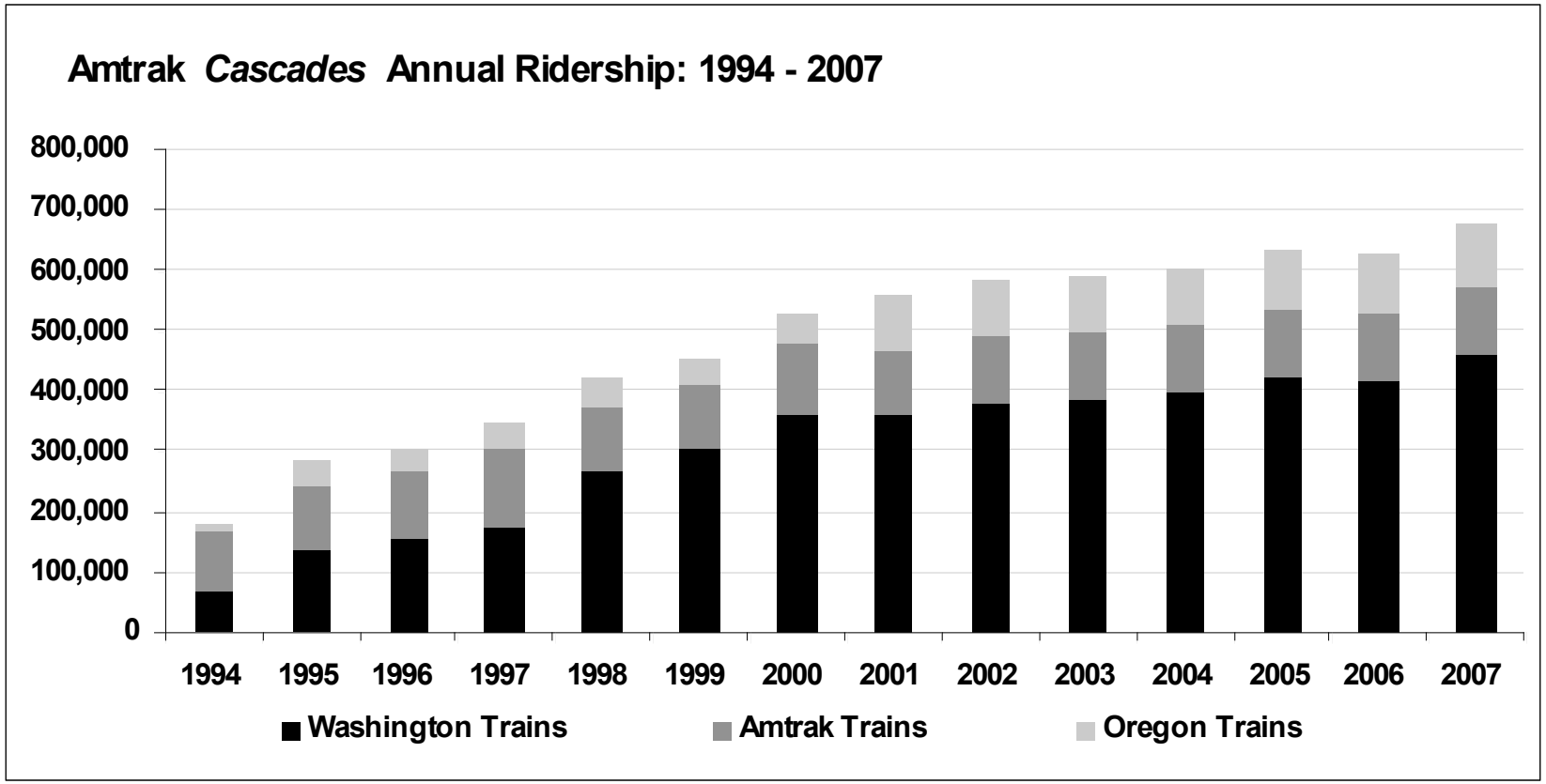
4 Round trips Seattle-Portland, 2 of them extending to Eugene

2 Round trips to Bellingham, 1 of them extending to Vancouver (BC)

TALGO in the PNW Corridor

- 5 High speed trains, 64 cars + 3 spares
- Design speed 120 mph; Operational speed 79 mph
- 20 year full service contract
- 99.9% availability
- Reliability 100,000+ Mean Miles Between Failures
- Partnership Amtrak-WSDOT-BNSF-Talgo
- Cascades Ridership increase 1994-2007: 375%

Amtrak Cascades Annual Ridership: 1994 - 2007



Keys to Success in the PNW Model

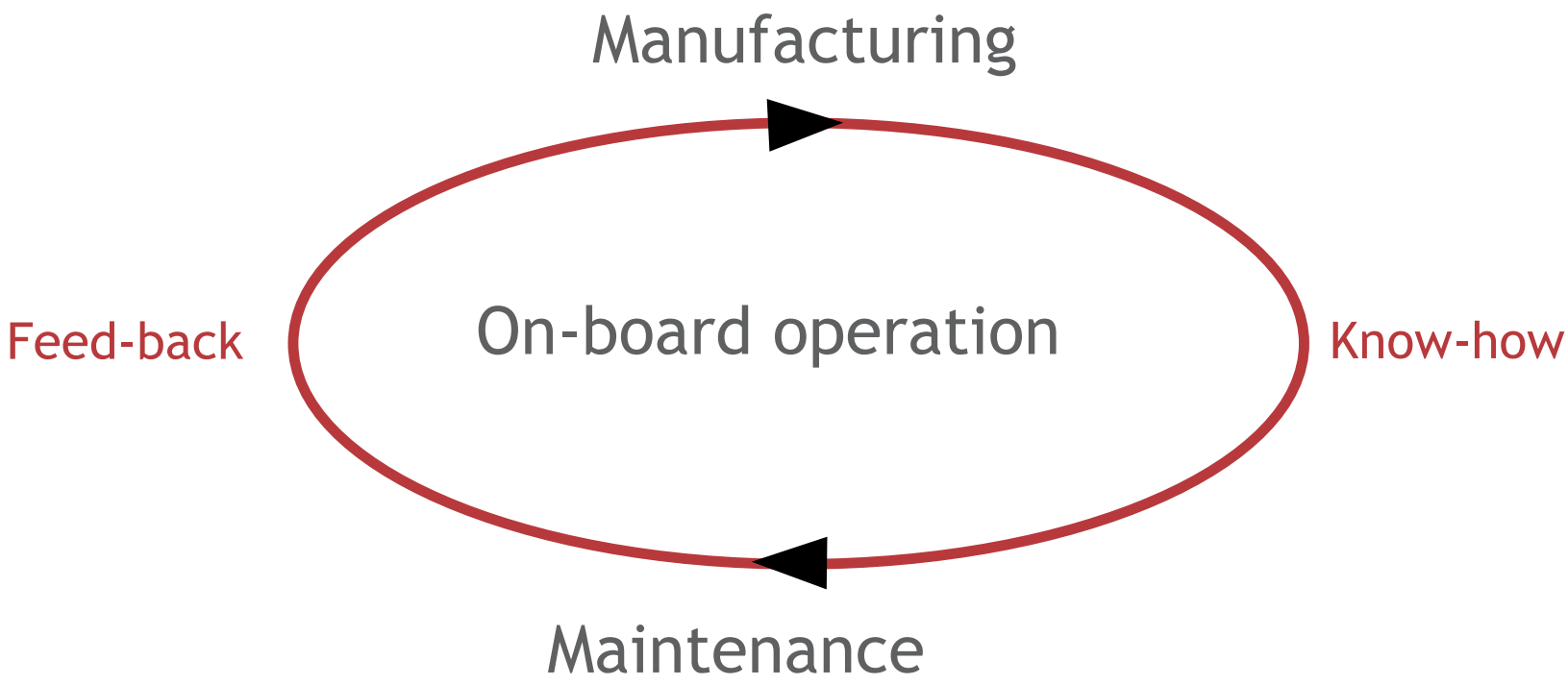
- Rail Plan
- Legislature Support: Funding
- Proven Technology
- Reliable Equipment
- Talgo provided maintenance
- Strong Partnerships: Amtrak-WSDOT-BNSF-UP-Talgo

Mid-Range Plan

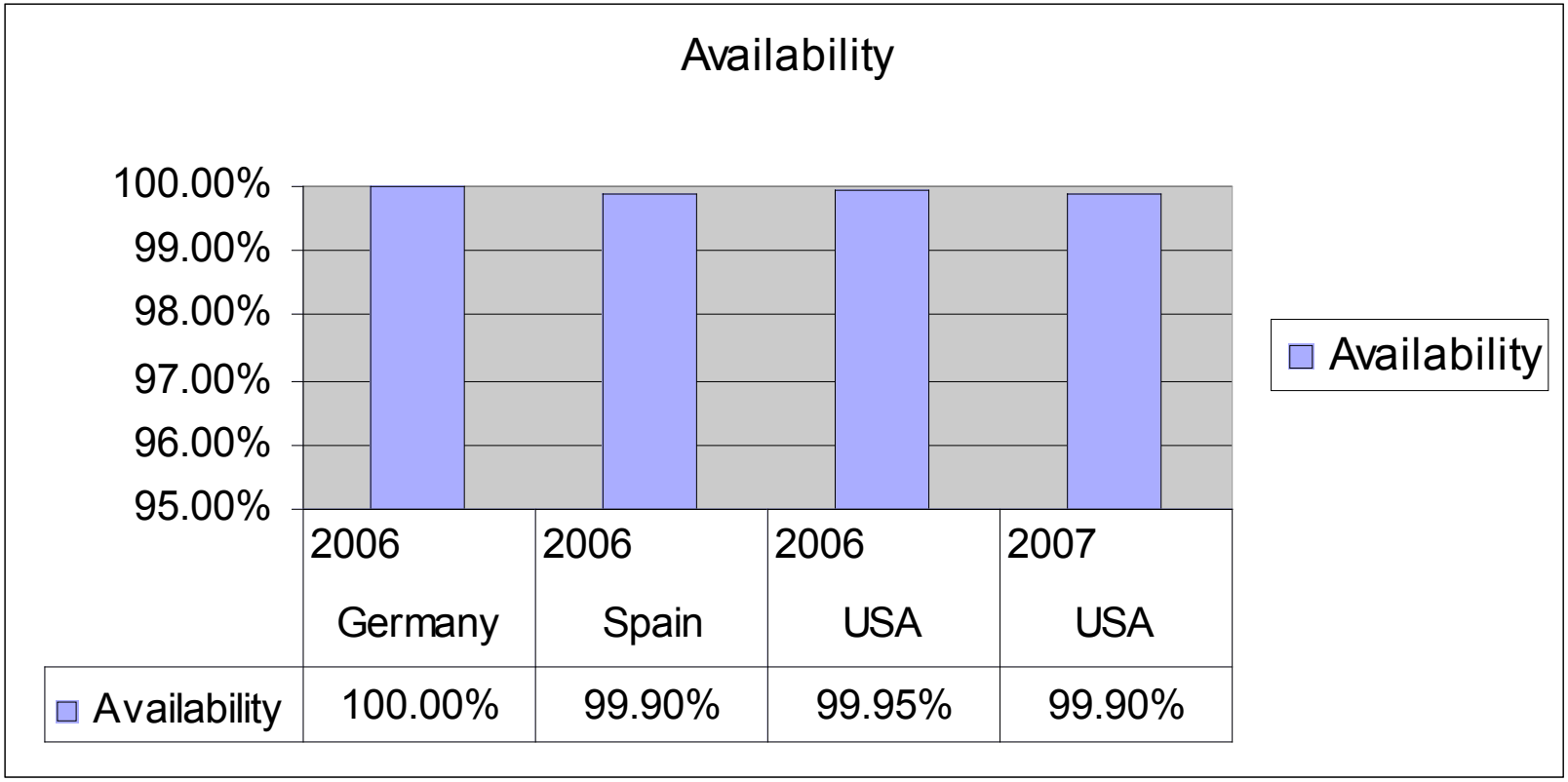
	Option 1	Option 2	Option 3	Option 4
Round trips - Sea-Pdx - Sea-Van	 4 1	 4 2	 6 2	 8 8
Trainsets	5	5	7 +more capacity	9 + more capacity + HS locomotives
Investment	$0	$141.2	$578.3	$816.8

TALGO SERVICES

Train maintenance

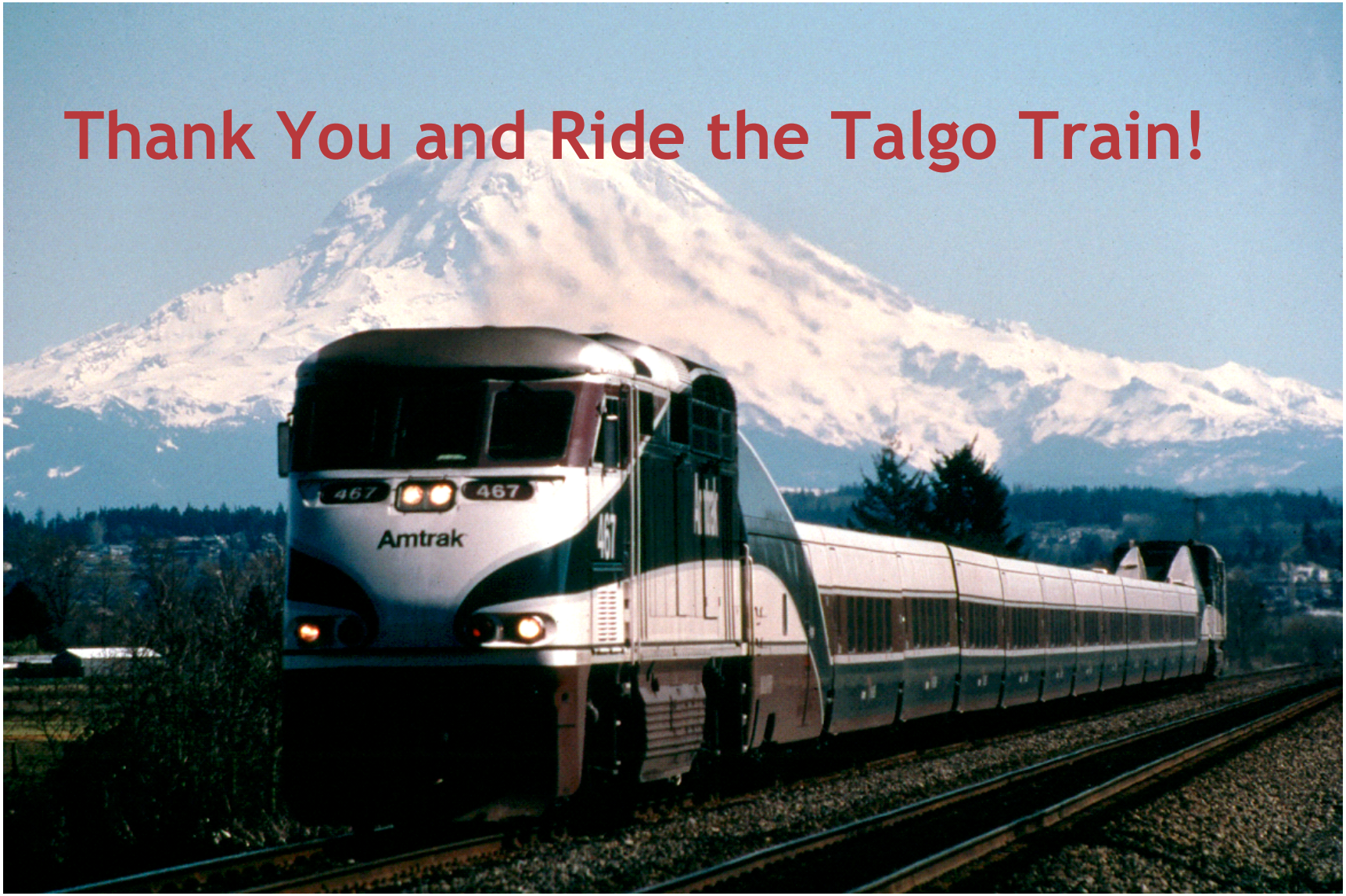


TALGO SERVICES



	2006 Germany	2006 Spain	2006 USA	2007 USA
Availability	100.00%	99.90%	99.95%	99.90%

Thank You and Ride the Talgo Train!



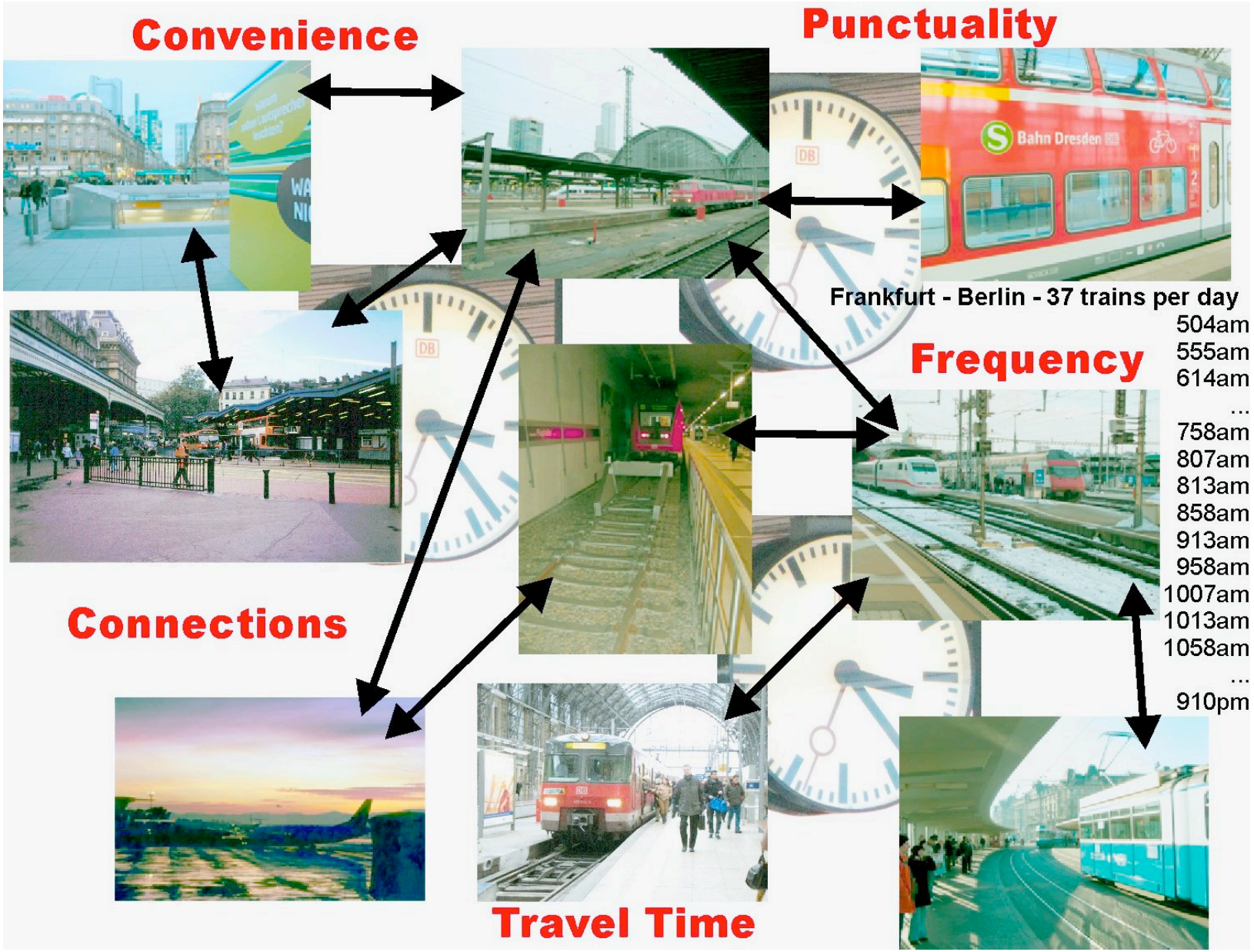
Talgo

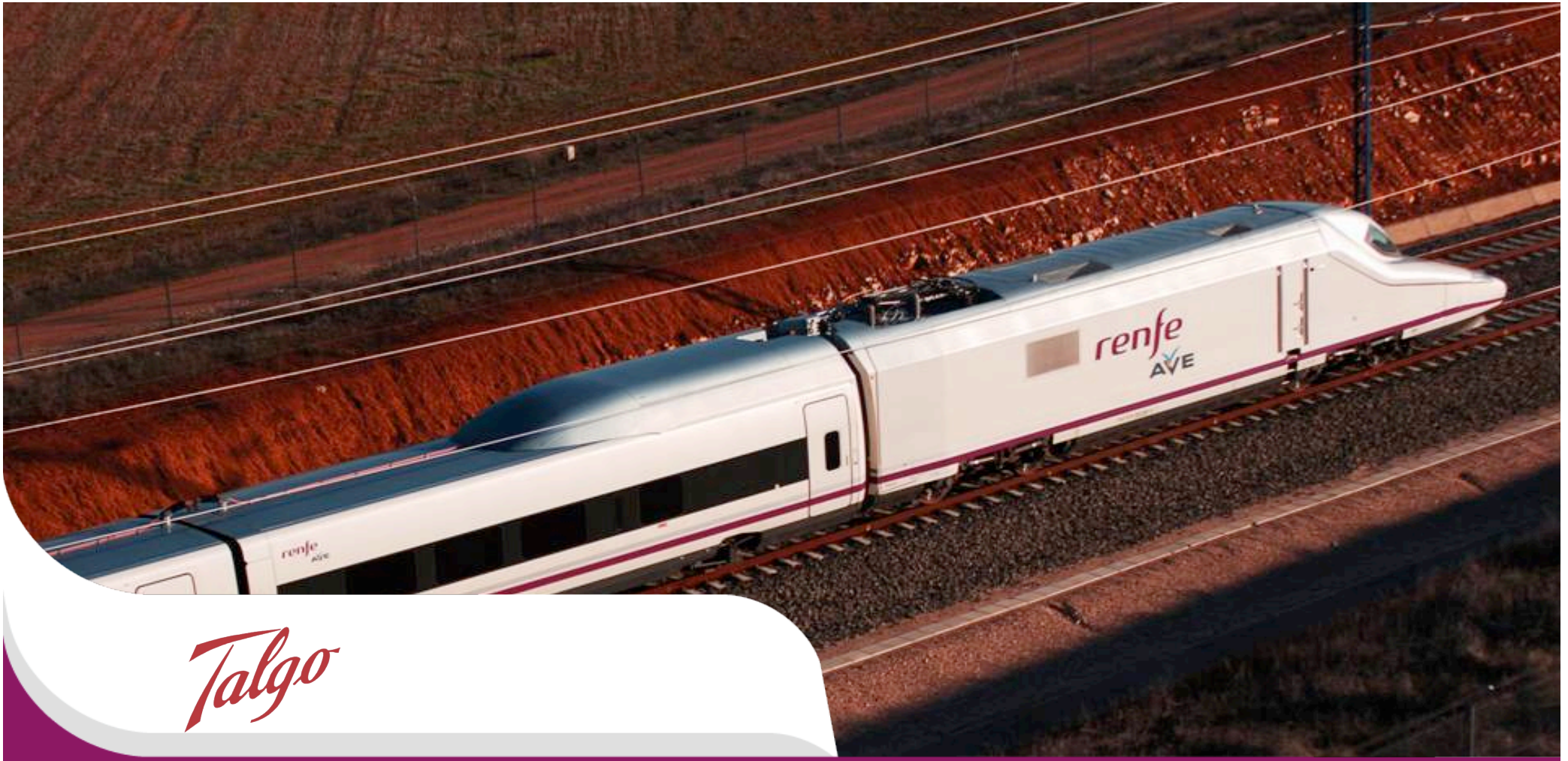
BREAK TO NEXT SECTION

Lessons we can learn from High Speed Rail Development in Europe

Talgo

Success depends on five essential elements





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Lessons from Spanish High Speed Rail Development

Spain

DEMOGRAPHIC DATA		SPAIN
SURFACE AREA (Square Km)		505,645
POPULATION (Millions)		45.20
POPULATION DENSITY (People per square Km)		89.6
GDP per capita (Dollars)		36.451

TRANSPORT INFRASTRUCTURE:		SPAIN
GENERAL RAILWAY NETWORK (Km)		13,338
HIGH SPEED RAILWAY NETWORK (Km)		1,563
ROADS (Km)		165,646
HIGHWAYS (Km)		13,156

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PEIT: Strategic Infrastructure and Transportation Plan 2005-2020

(A National Plan)

PEIT- Spanish Strategic Infrastructure and Transport Plan 2005-2020

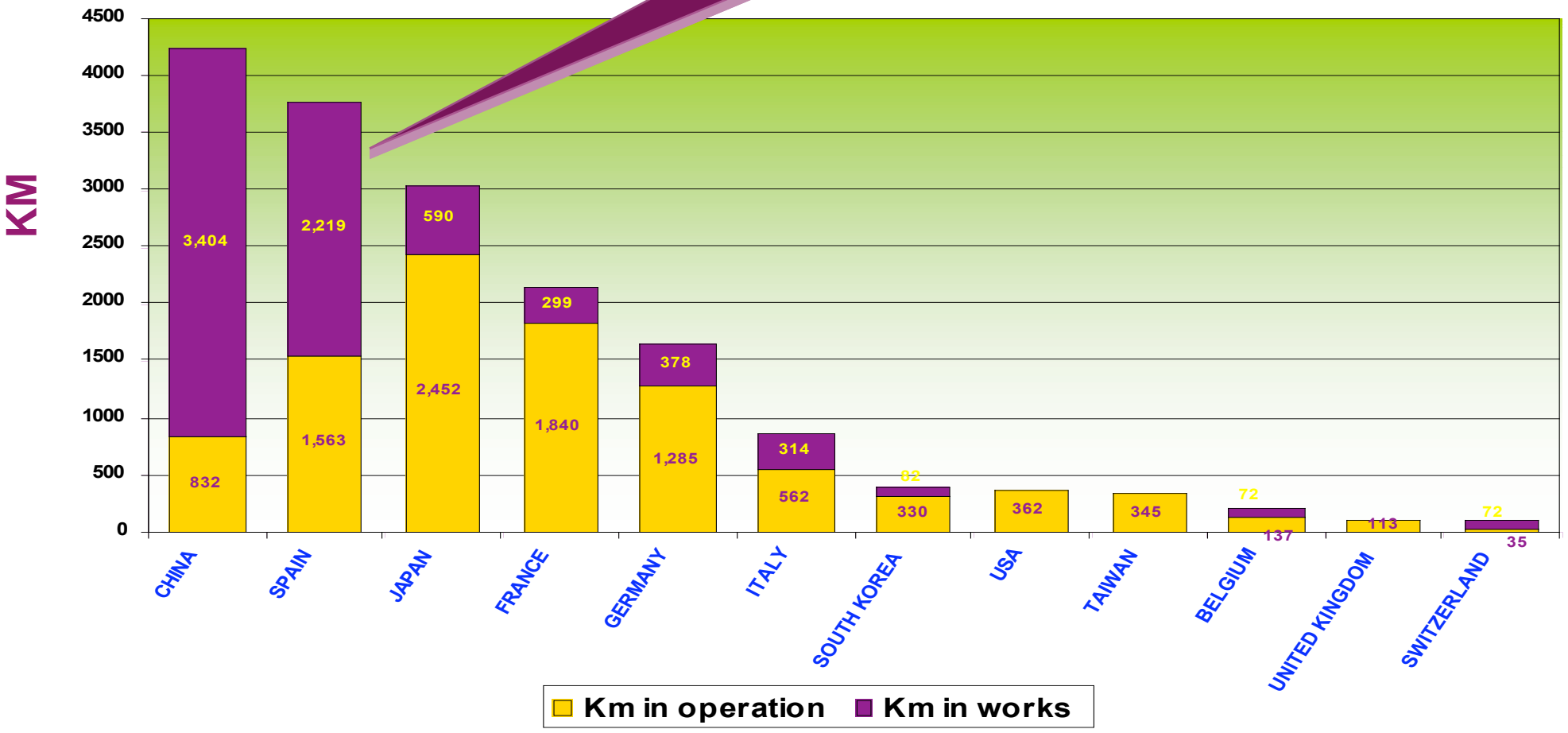
- **Main figures**

  – **High Speed Railway Infrastructure**

  - **Today: 1,563 Km of High Speed Tracks.**
  - **In 2010: 2,230 Km of High Speed Tracks:**
    - **First country in the world:**
      - **Japan: 2,090 Km**
      - **France: 1,893 Km**
  - **In 2020: 10,000 Km of High Speed or High Performance Tracks**
    - **50% of the population will have a High Speed Railway Station in their city.**
    - **90% of the population will have a High Speed Railway Station within 50 km**

Length of High Speed Lines in the world
In Operation + In Construction

SPAIN, SECOND IN THE WORLD



Sources of PEIT Investment Financing

TYPE OF INVESTMENT	% OF TOTAL INVESTMENT	SOURCE OF FINANCING	
		PUBLIC FUNDS	OTHER SOURCES
Roads	26.87%	75.0%	25.0%
Rail	48.70%	81.4%	18.6%
Airports	6.31%	2.2%	97.8%
Ports	9.92%	9.7%	90.3%
Others	8.20%	27.7%	72.3%
TOTAL	100%	59.5%	40.5%

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High Speed Services

Chronology

- The High Speed Business Unit is created in 1990.
- New approach: clear customer orientation.
- Founded as an integrated system.
- Commercial operations begin on 21 April, 1992.
- AVE infrastructure and traffic are separated at the end of 1993.
- The punctuality commitment was implemented on 12 September, 1994.
- In 1997, one year before the forecast, it obtains profits for the first time: 391 million pesetas (2.4 million euros).
- In October 1998 AVE obtains the European Quality Prize awarded by the EFQM.

The High Speed Services in Spain
SUMMARY

HIGH SPEED SERVICE:	FLEET		TRAINS / DAY	SEATS / DAY (*)
	IN OPERATION	MANUFACTURING		
LONG DISTANCE	66	30	139	52,074
MEDIUM DISTANCE	20	42	96	22,752
DOUBLE GAUGE	32	41	51	14,630
Total:	**118**	**113**	**286**	**89,456**

(*) Average

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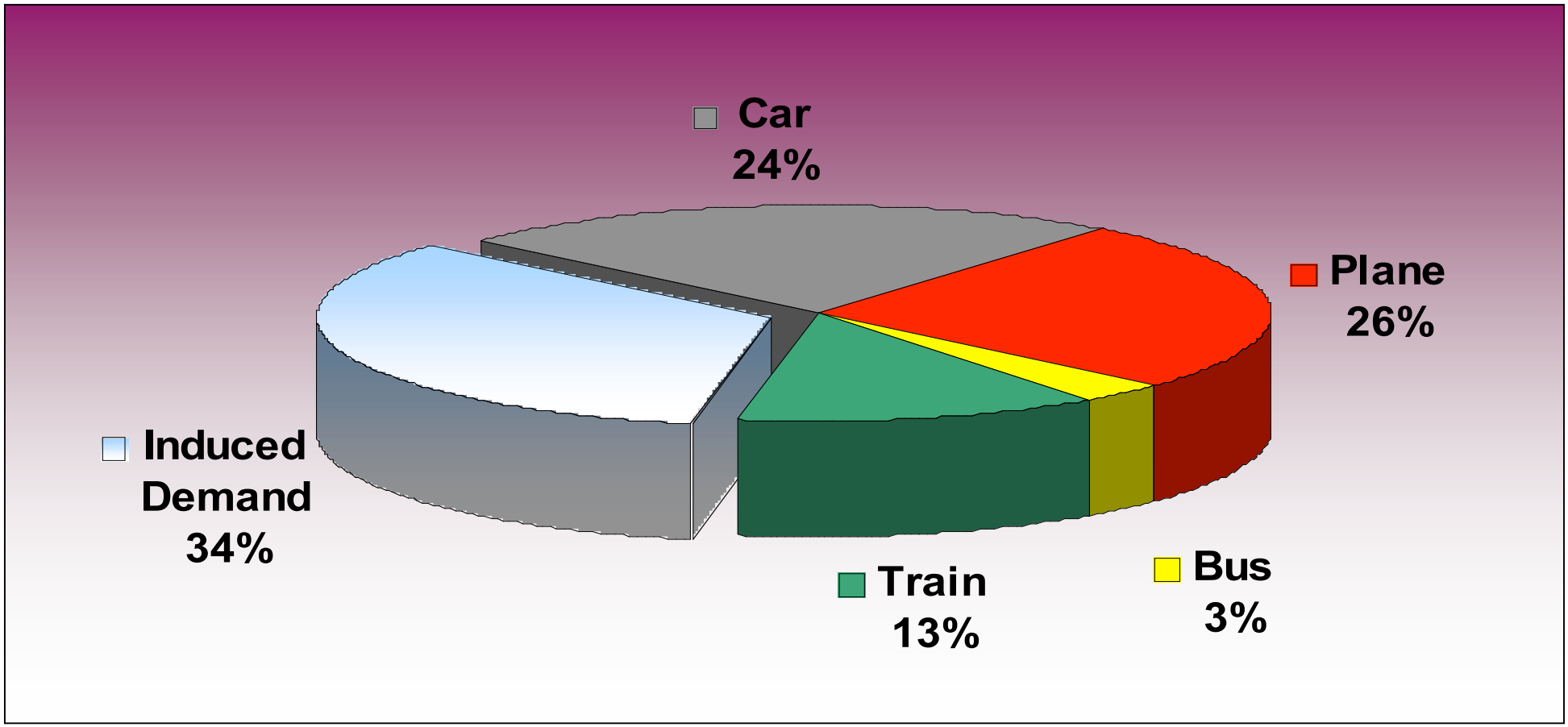
Main Figures about the Demand of High Speed Services in Spain

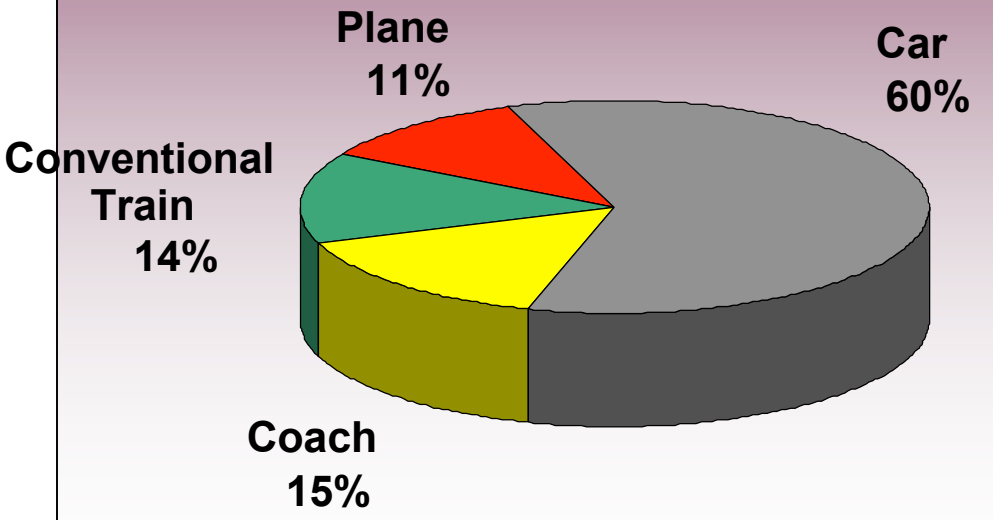
Source of Demand
Madrid – Sevilla (First year results)



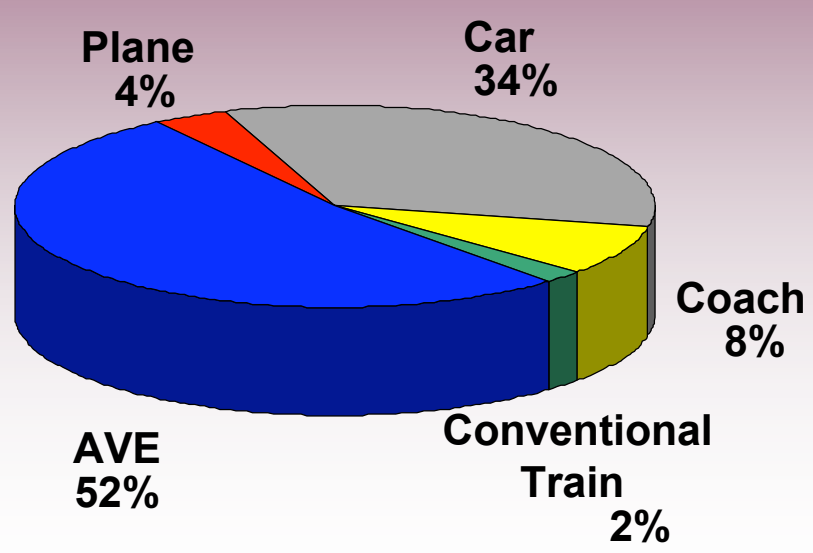
Modal Distribution: Madrid-Seville Corridor

APRIL 1992 New high speed service (AVE)

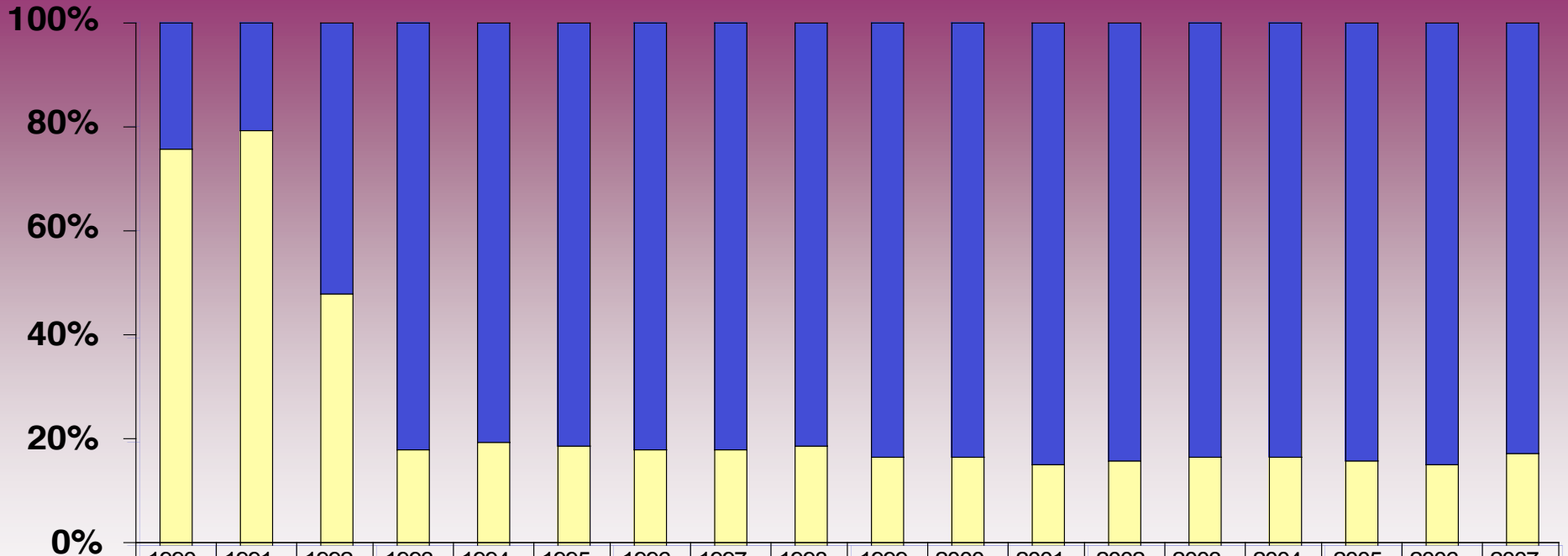
Before AVE (1991)



After AVE (1993)



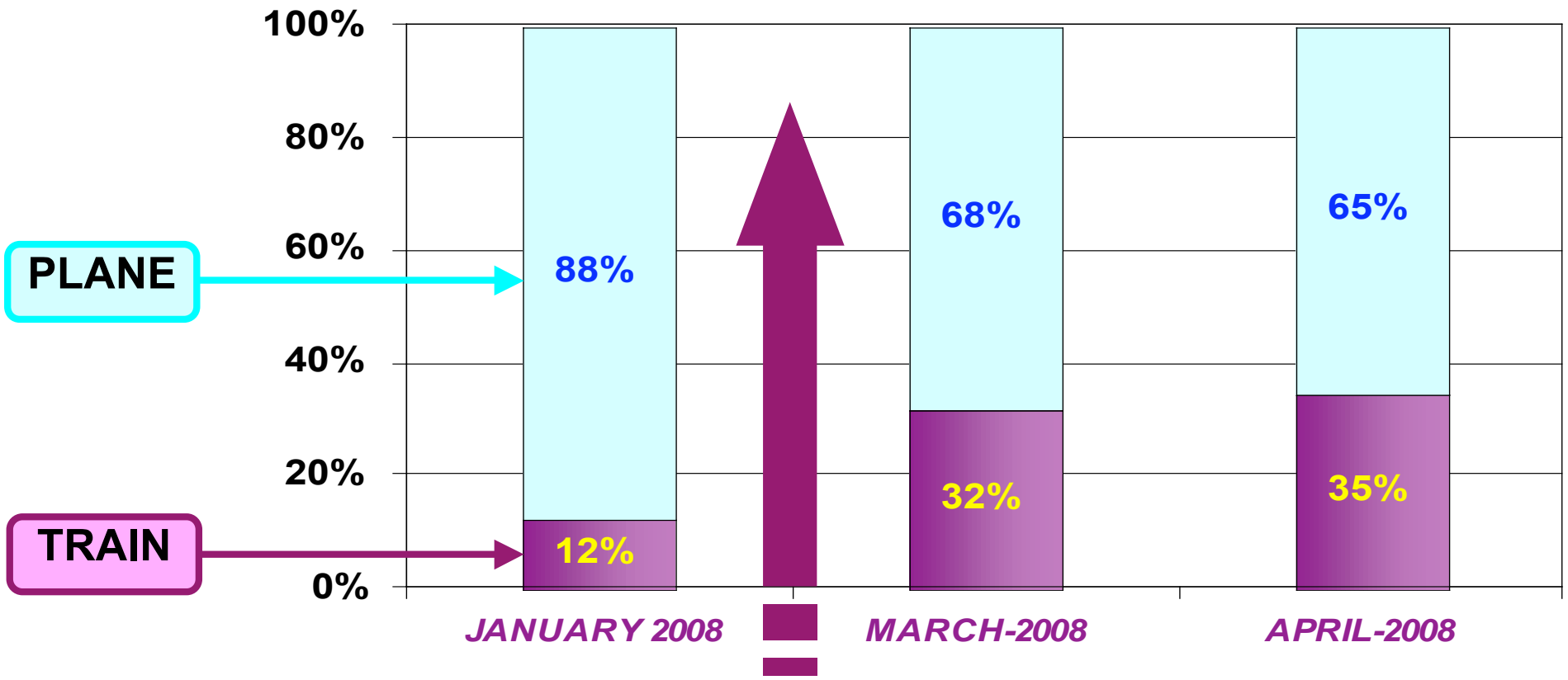
Market Share: Madrid-Sevilla
High Speed



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Train	23.7%	20.7%	51.6%	81.6%	80.0%	81.2%	81.6%	81.5%	81.2%	82.9%	83.4%	84.2%	84.1%	83.4%	83.2%	83.5%	84.4%	82.1%
Plane	76.3%	79.3%	48.4%	18.4%	20.0%	18.8%	18.4%	18.5%	18.8%	17.1%	16.6%	15.8%	15.9%	16.6%	16.8%	16.5%	15.6%	17.9%

THE MARKET SHARE EVOLUTION

Madrid-Barcelona, point to point



FEBRUARY-20

THE NEW HIGH SPEED SERVICE ARRIVES TO BARCELONA

renfe

Quality Commitments
RENFE-Operadora

Quality Commitments → SPAIN, 1ST IN DE WORLD

1st Stage

High Speed Punctuality Commitments → *World Pioneers*

2nd Stage

High Speed on-board services

New Quality Commitment → *World Pioneers*

Extend on-time commitment to all services: Long & Medium Distance

Future

Commercial Strategy will allow new stages → ***Increase Services commitments***

Employees & Suppliers alignment → Commitment-fulfilment

1st Stage: High Speed Punctuality

Punctuality Commitment:

World Pioneers

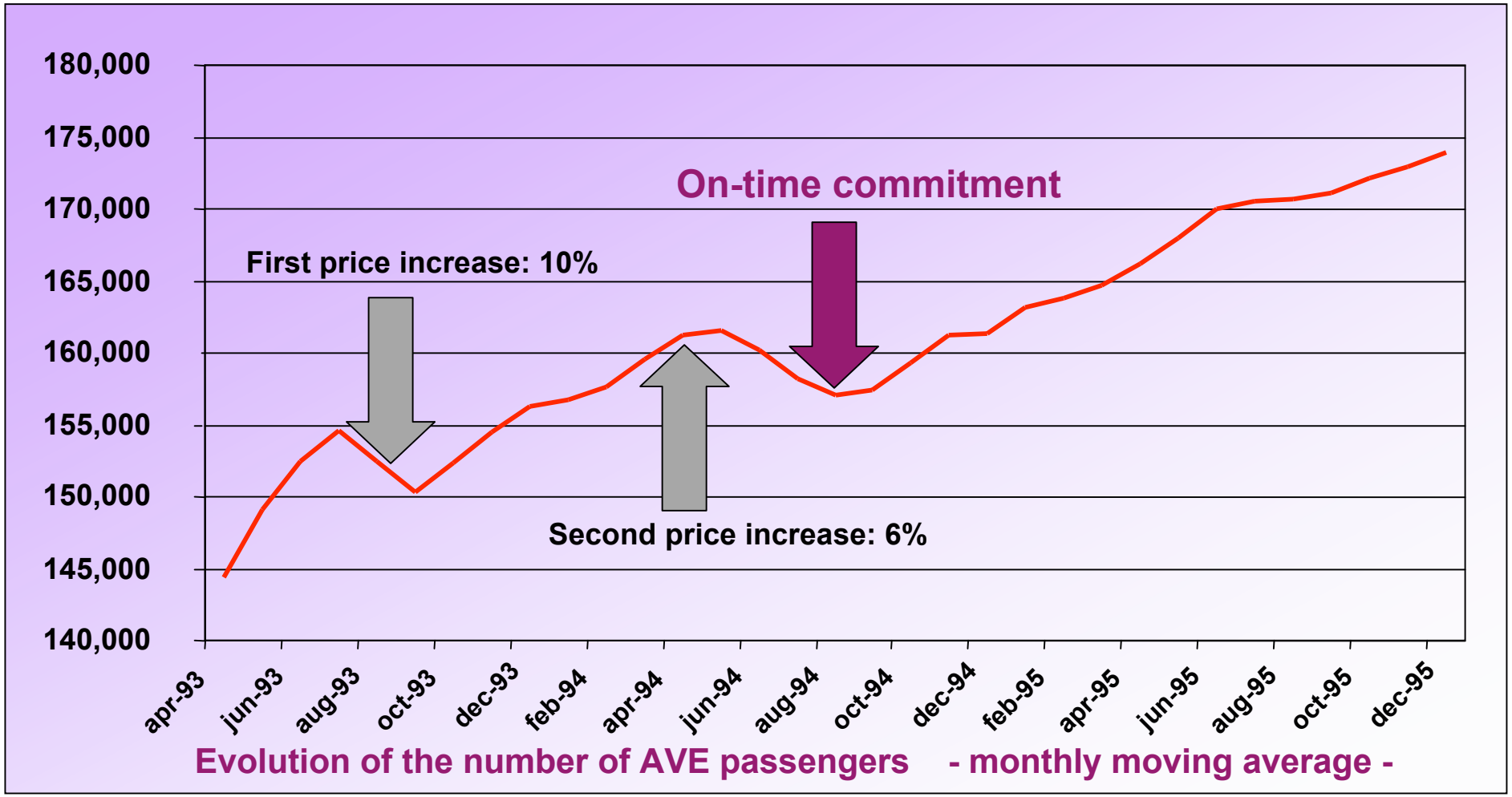
- **Date**: September 11, 1994
- **Product**: High Speed Trains

- **Commitment:**

Total ticket price refunded if a train arrives at its destination more than five minutes late

The price is refunded in cash, from the day after the delay

High Speed On Time Commitment Increased Demand Tendency



Evolution of the number of AVE passengers - monthly moving average -

High Speed Punctuality Commitment Financially Acceptable

Number of trains:

Total:	234,850	
Delayed:	875	O.37%

Number of Passengers:

Total:	58,677,312	
Delayed:	188,130	O.32%

Income (Mill. Euros):

Total:	2,122.6	
Refunds:	7.3	O.34%

Punctuality commitment on AVE trains from 12 September 1994 to 31 December 2007

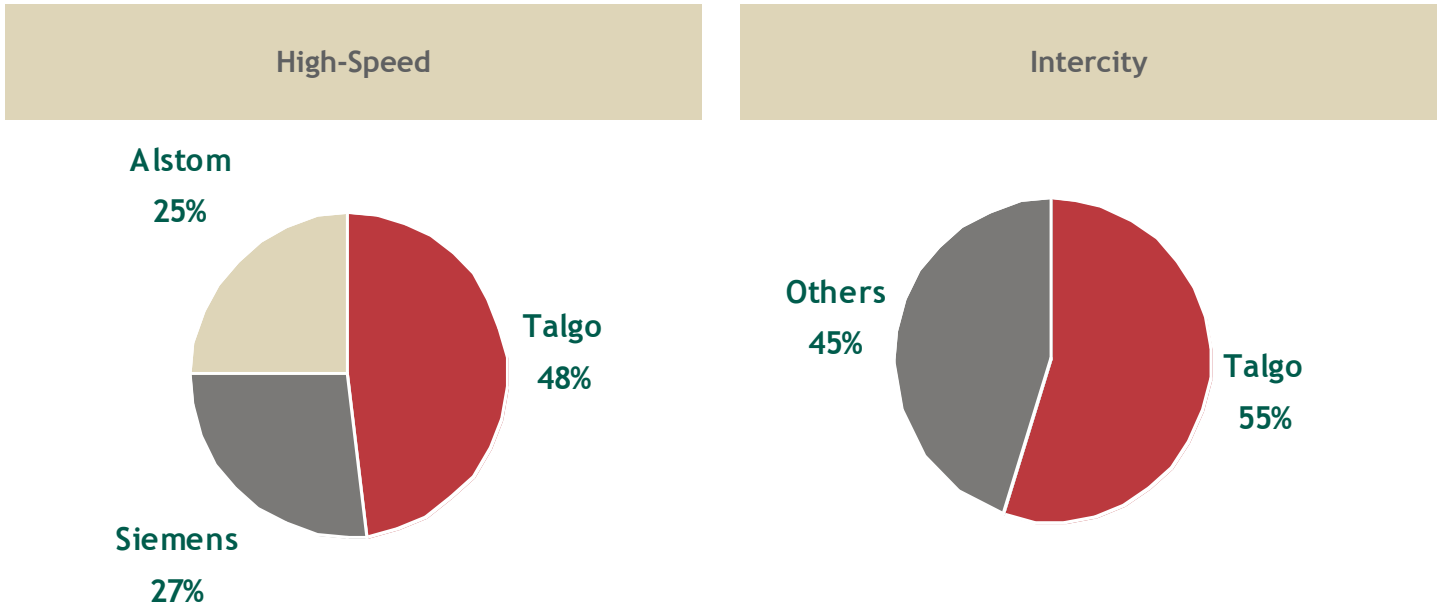
What can we learn from the Spanish Experience?

- **Political will** required to establish a National Public Policy that integrates rail with other transportation modes
- The US needs a **Federally funded National Plan** for Rail Development
- **Infrastructure** for High Speed (HS) services must be paid by public funds
- The operation can be **profitable**
- Provide a reliable, safe and quality oriented **service** and ridership will come
- **Regulations** for dedicated HS must be developed
- Welcome **new technologies** and learn from other countries
- **Performance based specifications** are preferable
- **Partnerships** with key suppliers, like Talgo, made it happen

Talgo

Talgo's Role in the Spanish HS Development
Leading Market Position in Spain

- Leading market position
  - 50% share in high-speed & 55% in intercity
  - Lead supplier to RENFE (c. 40% of contracts between 2001 and 2007)
  - Sole Spanish player focused on high value-added, high-speed trains
  - Strong valuable brand with high recognition
- Focused on developing high-speed infrastructures with high speed railways expected to growth from 1,031km in 2005 to 10,000km in 2020



Thank You and Ride the Talgo Train!