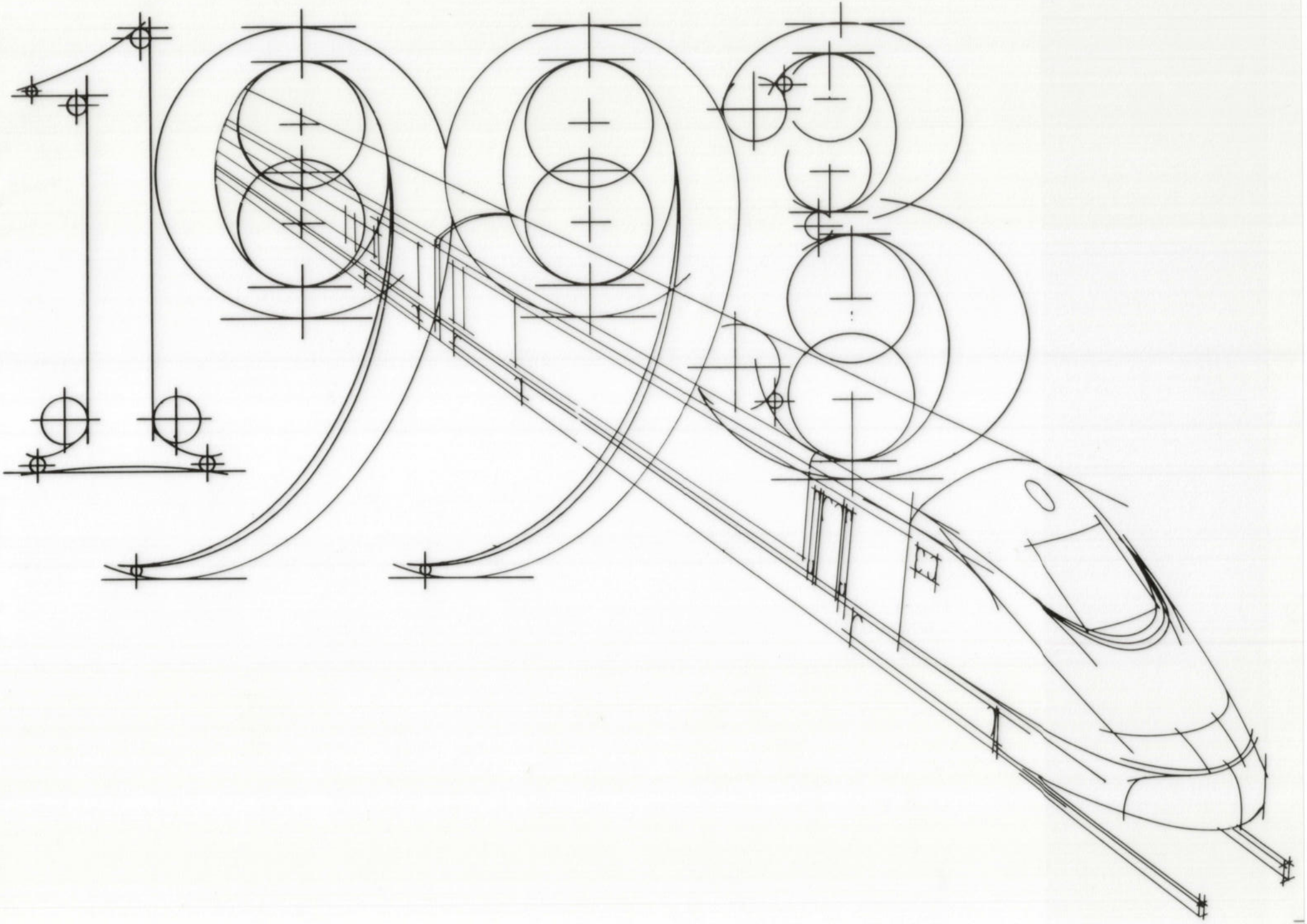
1993

SNCF B

THE JOINT DEVELOPMENT OF A HIGH SPEED TRAIN FOR EUROPE



A TRAIN FOR THE FUTURE

UN TRAIN PORTEUR D'AVENIR
EEN TREIN VOOR DE TOEKOMST

The cross-Channel high speed passenger train heralds a Europe which will soon be brought closer together. It has been made possible by the co-operation of the national railways of Britain, France and Belgium working together on the Channel Tunnel project. From 1993, people and ideas will be transported more readily than ever before – direct from one capital to another – not only faster, but also more easily, more safely, more punctually and more comfortably than by any other means of transport.

With the removal of the natural barriers between our railway systems, the movement of people and goods will increase. The extension, integration and interconnection of the high speed railway networks will be firmly on course. Rail is recognised as the means of transport of the future and, as the 21st century approaches, it will achieve its full potential with the cross-Channel link.

The accessibility of this first joint European venture to all people will no doubt contribute to a great commercial success and confirm its social and economic advantages, bringing the utmost benefit to Great Britain, France and Belgium. Their national railway companies, British Rail, SNCF and SNCB/NMBS, intend to take full advantage of this unique opportunity to connect their railway networks, thereby considerably improving the movement of people and goods throughout Europe.

As the first major step towards achieving this aspiration, the three railway operating companies are jointly ordering the future high speed rolling stock for passenger traffic.

Sir Robert Reid
Chairman
British Railways Board

Jacques Fournier
President
Société Nationale des Chemins de Fer Français

Didier Reynders
President
Société Nationale des Chemins de Fer Belges
Nationale Maatschappij der Belgische Spoorwegen

LINKING EUROPE BY RAIL

AN ESSENTIAL RAIL LINK

UN LIEN FERROVIAIRE ESSENTIEL
EEN ONMISBARE SPOORVERBINDING

The first proposal for a fixed link between France and Great Britain was put forward by Nicolas Desmaret as long ago as 1751. Twenty-five other schemes have followed, most of them technically impossible. Only two, in 1882 and 1974, progressed as far as the start of construction work, only to be abandoned for strategic, political and financial reasons.

The development of the Common Market has played a driving role in the growth of travel and trade between the two sides of the Channel. Air and sea traffic has doubled in volume in the last ten to fifteen years and will have doubled again shortly after the turn of the century.

In order to cope with this increase, it is essential to provide a fixed link between Great Britain and mainland Europe, or else face the unacceptable consequences of severe congestion. The Channel Tunnel is therefore vital, even without allowing for the fact that it will provide the 'missing link' in the future European high speed rail network.

The advantages of speed and convenience which the Tunnel brings will themselves help to contribute to the growth of intra-Community movement.

DIRECT RAIL LINKS

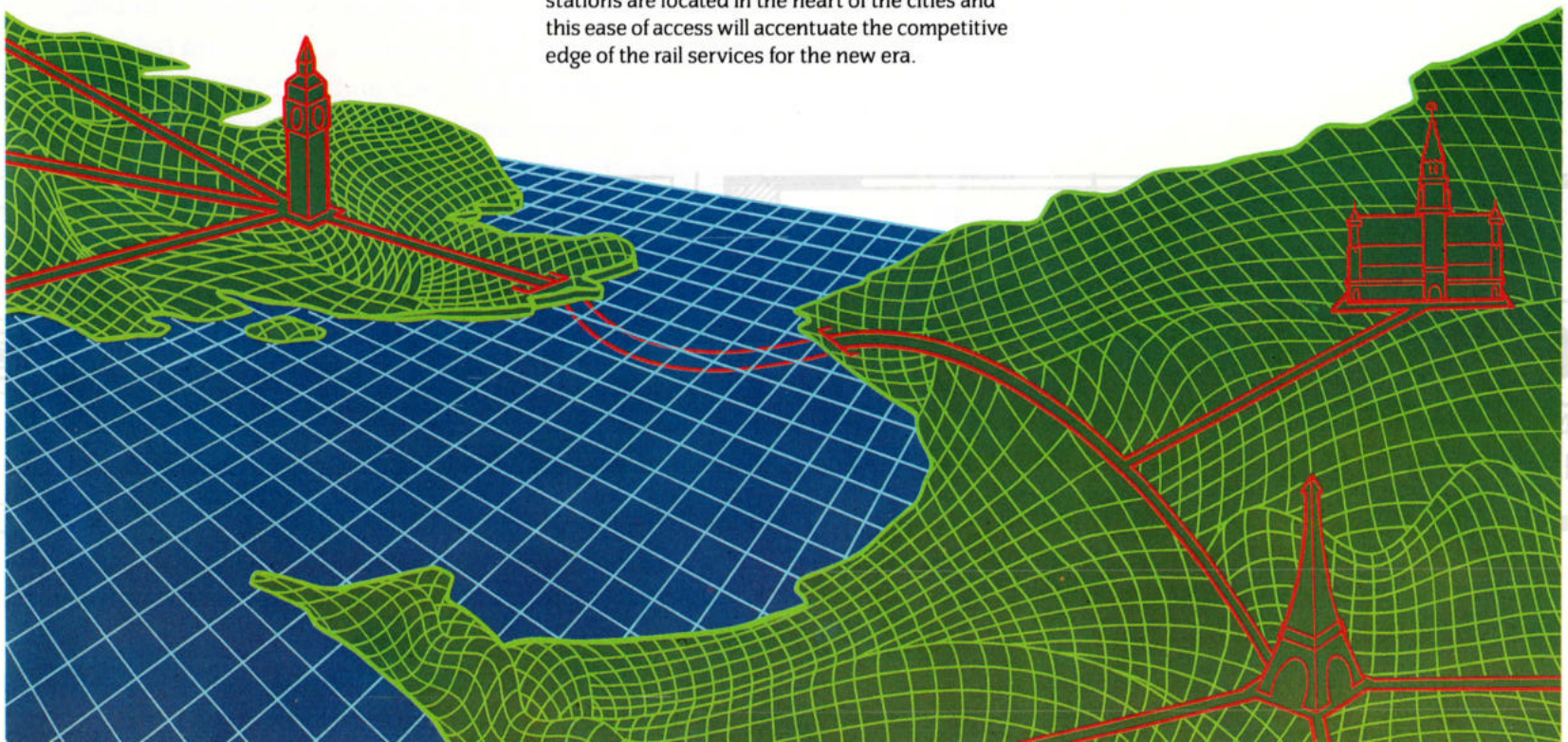
DES LIAISONS FERROVIAIRES DIRECTES
RECHTSTREEKSE TREINVERBINDINGEN

The opening of the Tunnel will enable a direct link to be provided between the capital cities of London and Paris, and London and Brussels. The stations are located in the heart of the cities and this ease of access will accentuate the competitive edge of the rail services for the new era.

INTERCONNECTING BR – SNCF – SNCB/NMBS RAIL NETWORKS

L'INTERCONNEXION DES RESEAUX FERROVIAIRES BR SNCF SNCB
BR, SNCF EN NMBS: VERBONDEN NETTEN

The interconnection of the European rail networks will allow passengers to travel, without changing trains, from London to Paris, Brussels, Lille or Fréthun, near Calais; an international station at Ashford in Kent could also serve the Belgian and French capitals as well as Lille. Easy access to other areas of Great Britain and mainland Europe will open up new possibilities for business and leisure travel and eventually high speed passenger travel well beyond Paris and Brussels, to Lyons or Amsterdam for example. It is intended that a variant of the inter-capital high speed train will use British Rail's InterCity routes, at conventional train speeds, to cities such as Birmingham, Manchester, Leeds or Edinburgh.



BRINGING EUROPE CLOSER TOGETHER

RASSEMBLER L'EUROPE
EUROPA DICHTER BIJEENBRENGEN

The SNCF are building a high speed Northern Line linking Paris and the Belgian border with the Tunnel, via Lille. This line will connect with the whole of the existing French high speed South East and Atlantic systems by 1994, when a new connecting link in the Paris region is due for completion.

The Belgian government has decided to include Belgium in the international high speed rail network. The cross-Channel link will reach Brussels by mid-1993 and the opening of a new line between the French border and the Belgian capital will allow high speed services to run by 1995. At a later stage, this link with Brussels will be extended towards Germany and the Netherlands.

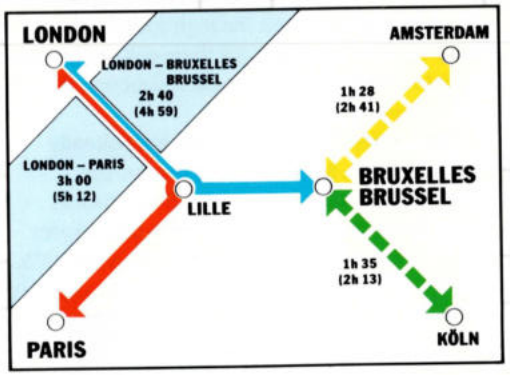
To complete the new rail network, British Rail is also planning to build a new rail link between Folkestone and London.

INTER-CAPITAL RAIL NETWORK

LIAISONS FERROVIAIRES ENTRE CAPITALES
SPOORWEGNET TUSSEN DE HOOFDSTEDEN

MAIN JOURNEY TIMES

PRINCIPAUX TEMPS DE PARCOURS
BELANGRIJKSTE REISTIJDEN



3h 00 Journey time achievable with high speed trains
Temps de parcours après mise en service des trains à grande vitesse
Reistijd met hogesnelheidstrein

(5h 12) Best journey time currently
Meilleur temps de parcours actuel
Snelste reistijd nu

Inter-capital services
Liaisons entre capitales
Diensten tussen de hoofdsteden

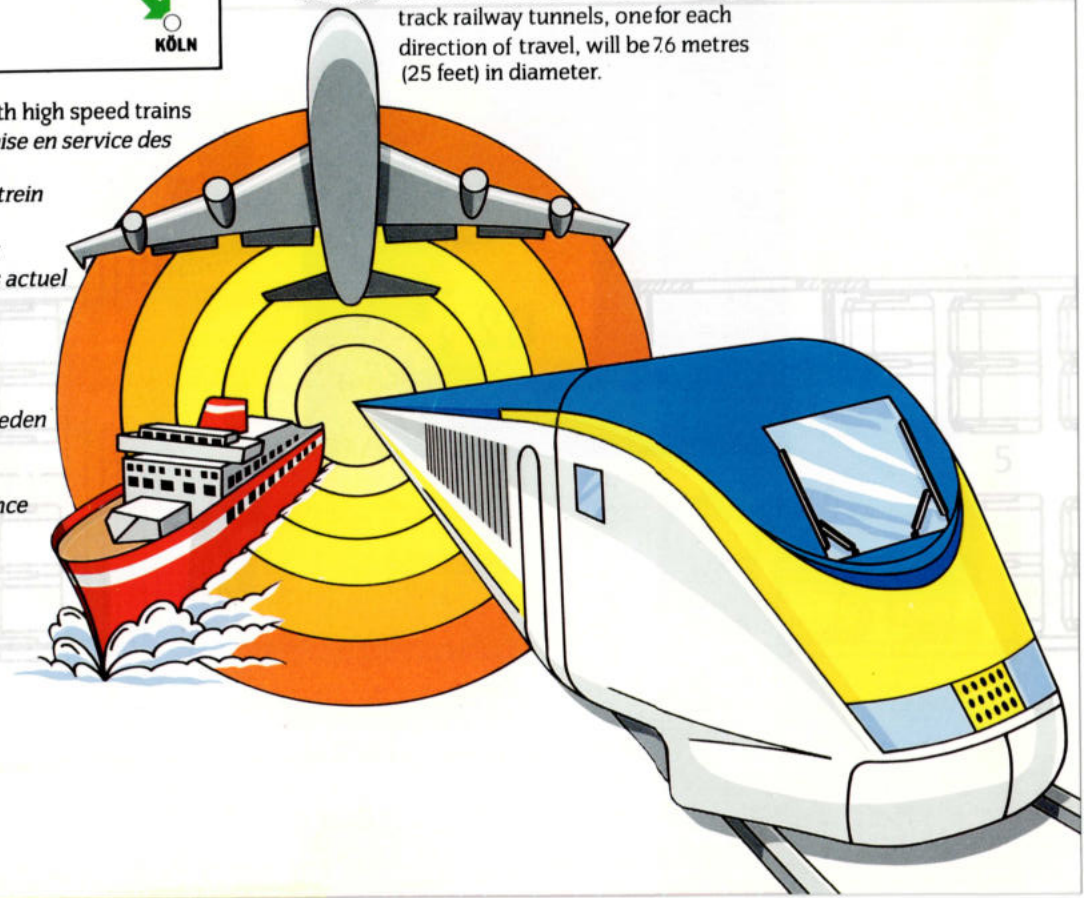
Connecting services
Dessertes en correspondance
Aansluitende diensten

THROUGH THE CHANNEL TUNNEL

A TRAVERS LE TUNNEL
DOOR DE KANAALTUNNEL

Work on tunnel boring started in November 1987 and should be completed in 1991. The date for the opening of services through the Tunnel is expected to be 15 June 1993.

The 50 kilometre (31 mile) underground link will run for 37 kilometres (23 miles) actually under the Channel, at an average depth of 40 metres (130 feet). It will consist of three tunnels: two parallel railway tunnels lying 15 metres (50 feet) either side of a central service tunnel which provides for ventilation, maintenance and safety. Cross passages every 375 metres (1230 feet) will link the rail tunnels with the service tunnel. The single track railway tunnels, one for each direction of travel, will be 7.6 metres (25 feet) in diameter.



THE EUROTUNNEL OPERATION

THE EUROTUNNEL GROUP

LE GROUPE EUROTUNNEL
DE GROEP EUROTUNNEL

In 1987 the British and French governments ratified the Anglo-French Channel Tunnel Treaty. This treaty awarded a Concession for the design, finance, construction and operation of the Channel Tunnel link to Eurotunnel, a private Anglo-French group formed of two companies, the Channel Tunnel Group and France Manche.

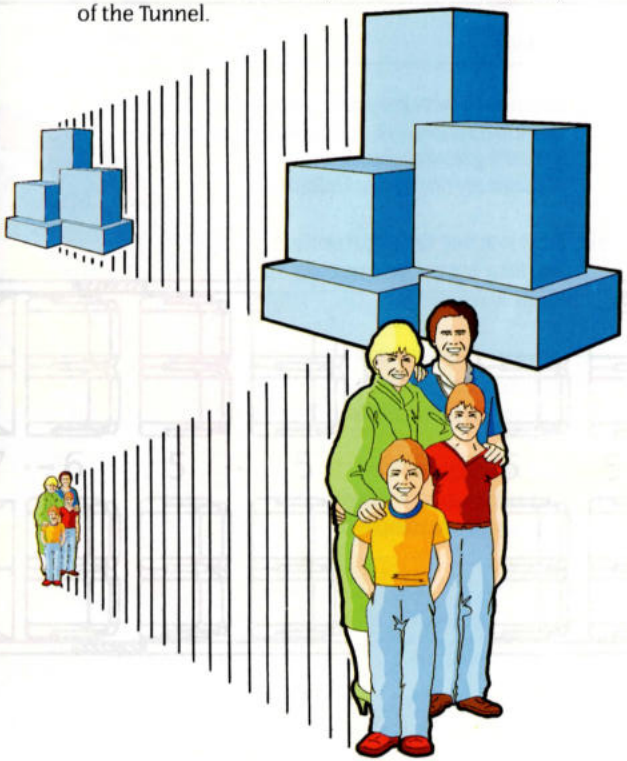
Eurotunnel has contracted the design and construction of the system to ten large French and British construction companies, who have joined together to form the Transmanche Link (TML) group.

TRAFFIC LEVELS

IMPORTANCE DU TRAFIC
VERKEERSVOLUME

When the Tunnel opens in 1993, traffic will be equivalent to that of a two-lane motorway in each direction, that is 15 million tonnes of freight and more than 30 million passengers annually. Around 40% of the latter will use the high speed through trains. At the start of service there will be capacity for up to 200 movements in each direction every twenty-four hours.

Some independent observers have already concluded that, because of the favourable economic situation in Europe and worldwide, traffic levels could rise to 41 million passengers and 23 million tonnes of freight by the year 2003. This demand can be safely met within the capacity of the Tunnel.



TUNNEL OPERATION

LE FONCTIONNEMENT DU TUNNEL
EXPLOITATIE VAN DE TUNNEL

The Concession awarded to Eurotunnel requires the project to be financed entirely from the private sector, with no government guarantees. Although not directly involved in any aspect of the Tunnel project itself, British Rail and SNCF have entered into a contract with Eurotunnel giving 50% of the available tunnel capacity to the national railways to run their own through passenger and freight trains.

RAIL TRAFFIC TYPES

TYPES DE TRAFIC FERROVIAIRE
SOORTEN VAN SPOORWEGVERKEER

The Channel Tunnel will carry three types of rail traffic: passengers, freight and vehicles. The national railways will take passengers from London and other British cities to Paris and Brussels on their through high speed trains as well as on conventional night trains, linking many cities on both sides of the Channel.

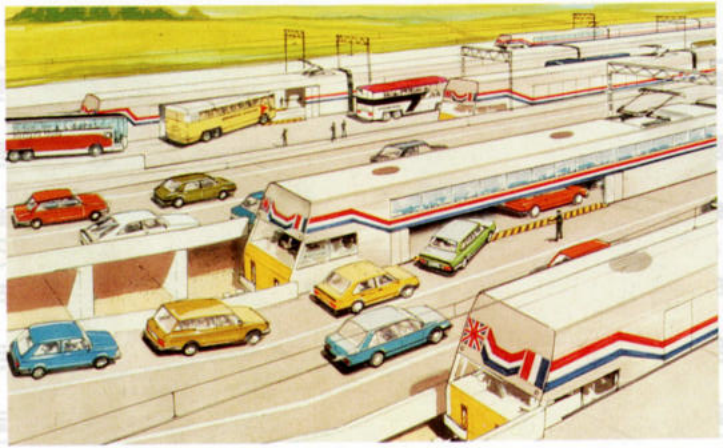
The national railways will also run international freight trains between all parts of Great Britain and mainland Europe.

The third category will be Eurotunnel shuttle trains carrying road vehicles and running through the Tunnel in a loop between the shuttle terminals.

SHUTTLE TERMINALS

LES TERMINUS DES NAVETTES
PENDELTERMINALS

Apart from the tunnel boring work, Transmanche Link is also progressing quickly with building the terminals for the Eurotunnel shuttle trains on a 700-hectare site at Coquelles near Calais, and at Cheriton on 350 hectares adjacent to Folkestone. At these terminals, the shuttle trains will pick up and unload cars, caravans, coaches and heavy goods vehicles.



THE CROSS-CHANNEL LINK: CUSTOMER ADVANTAGES

RELIABILITY OF RAIL

LA FIABILITE DU RAIL
BETROUWBAARHEID VAN HET SPOOR

Reliability is a very significant advantage of the Channel Tunnel. Trains will be unaffected by adverse weather conditions. The reservation system will guarantee a seat from the departure station to the destination and avoid the inconvenience and discomfort which is sometimes associated with waiting at air and sea ports.

Another bonus is the frequency of the regular services. Between 6.30am and 9.00pm at least one train per hour in each direction will run between London and Paris, and one between London and Brussels. There will be additional trains at times of peak demand.

HIGH SPEED

LA GRANDE VITESSE
HOGE SNELHEID

Travellers using the high speed trains will reach the heart of Paris just three hours after leaving London, or Brussels in a mere two hours forty minutes.

These very fast inter-capital city journey times will also improve travelling times to other mainland European and British cities. Once the new rail link between Folkestone and London is in operation, the journey to Paris will be reduced to only two and a half hours, and Brussels will be only two hours ten minutes from London.

In order to achieve these targets, the most advanced high-performance technology will be put to work, alongside many new developments in the field of high speed railway transport.

Trains will reach speeds of 300 kilometres per hour (185 mph) for most of the journey. In the Tunnel itself, the maximum speed will be restricted to 160 kilometres per hour (100 mph).

High speed trains give the Channel Tunnel a new dimension which neither Jules Verne nor any of the previous Channel Tunnel pioneers could have imagined.

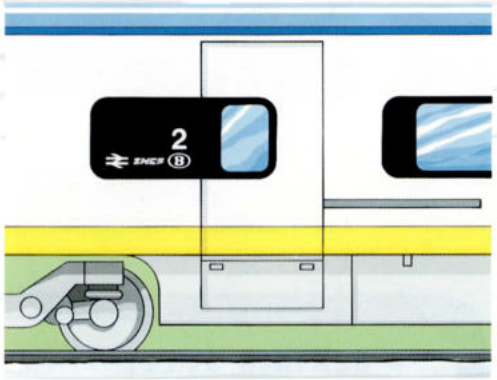
THE PASSENGER TRAINS

A HIGH LEVEL OF COMFORT

UN CONFORT PARTICULIER
TOPCOMFORT

These special passenger trains have been designed to provide a high level of comfort and convenience for all, whether tourists or business travellers, families with babies or those in wheelchairs.

The connecting doors[1] between coaches within the train will open by simple pressure on a handle or push button. Access doors[2] to or from



the platform, using a similar mechanism, can only be opened when the train is stationary and an audible signal will warn passengers when these doors are closing. Steps from the access doors will automatically adjust to the differing platform heights in each country.

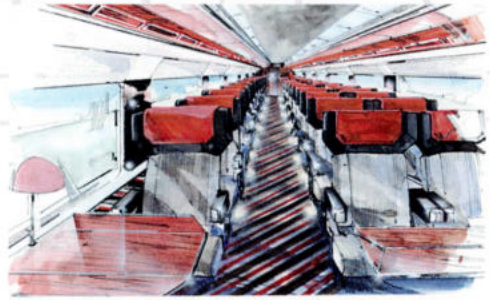
Heavy luggage can be carried in a separate luggage compartment[3] which will also carry parcels but there will be luggage racks[4] in each coach, allowing passengers to take all their hand baggage with them in the coach.

CONVENIENCE FOR ALL

DES INSTALLATIONS POUR TOUS
GERIEFELIJK VOOR IEDEREEN

Each train will consist of 18 articulated coaches, together with a power car at the front and one at the back. The sequence of the first nine coaches, as shown in the train layout diagram, is repeated for the second half of the train.

In order to give a smooth comfortable ride, particular attention has been paid to the quality of the suspension, air conditioning, ventilation, noise insulation and interior lighting.



The aim is to give a relaxed, convivial atmosphere. The seats, storage spaces and all furnishings and fittings, have been designed to make the journey as enjoyable as possible.

Passengers will have a choice of seats. In the layout of seating provided, some are arranged in line airline style[5], some face-to-face[6] and separated by a table[7] and others in the "family" compartments[8] have tip-up seats. All First Class seats recline. Other features include footrests, reading lights, magazine-racks, bottle and glass holders, ashtrays in the smoking coaches[9], rubbish bins, coat hooks, storage spaces and First Class relaxation areas[10]. The width of the aisles and the layout of the toilets[11] have been designed with particular care.

NB: The numbers shown in the text refer to the diagram at the back of the brochure.

PASSENGER FACILITIES

SPECIAL NEEDS

BESOINS PARTICULIERS
BIJZONDERE NODEN

Two special areas for families with infants[12], located close to the family compartments, will include private nappy changing facilities and many special features designed to make travelling with tiny children as convenient and comfortable as possible.

The needs of the disabled have not been forgotten. Passengers can travel in their own wheelchairs, with a companion seat adjacent, in clearly identified coaches[13]. Corresponding door widths and special toilets[14] allow for wheelchair access.

NB: The numbers shown in the text refer to the diagram at the back of the brochure.

SMALL SNACKS AND BIG APPETITES

PETITES COLLATIONS ET GROS APPETITS
VOOR KLEINE EN GROTE HONGER

One bar-buffet catering car in each half of the train will serve drinks and hot or cold snacks which can be eaten there or taken back to your seat. Refreshments will also be available from a trolley service and First Class passengers will have the option of a meal served at their seat.

KEEPING IN TOUCH

GARDER LE CONTACT
EVEN BELLEN

All travellers on these high speed trains will have access to several telephones[15] for both national and international calls.

A CERTAIN STYLE

UN CERTAIN STYLE
EEN EIGEN STIJL

The best British, French and Belgian designers have been selected through an international competition, with the aim of personalising the interior decor of the coaches and making them distinctive and welcoming.

Stations are also being redesigned and specially arranged to receive the new trains and give easy access for passengers. All in all, a cross-Channel journey by rail will be far more comfortable and enjoyable than travelling by air or sea.

NB: The numbers shown in the text refer to the diagram at the back of the brochure.

NEW ROLLING STOCK FOR THE THREE RAILWAYS

OVERCOMING TECHNICAL CONSTRAINTS

SURMONTER LES CONTRAINTES TECHNIQUES
TECHNISCHE MOEILIJKHEDEN OVERWINNEN

The most difficult design constraints result from the need to use the new rolling stock on national railway networks which have many different characteristics. The power units for the trains will be fitted with asynchronous motors and the trains must function with three types of power supply:

- with a supply of 25000 V, alternating current of 50 Hz, collected from the overhead line, on the high speed lines and in the Eurotunnel;
- with a supply of 3000 V, direct current, also collected from the overhead line on the SNCB/NMBS network;
- with a supply of 750 V, direct current, on the British Rail Southern Region network (collected from a third rail by means of retractable shoes).

Additionally, the trains must be compatible with the different infrastructure of the three railways. The size and shape of the trains must fit the loading gauge of each of the three railways and also take account of the various different platform heights and types of signalling equipment. French and Belgian as well as British train drivers will operate over the length of the routes and so the indicators in the driving cabs of the trains will be in three languages, except where pictograms can be used, and twin speedometers will display kilometres and miles per hour.

A MODEL OF CO-OPERATION

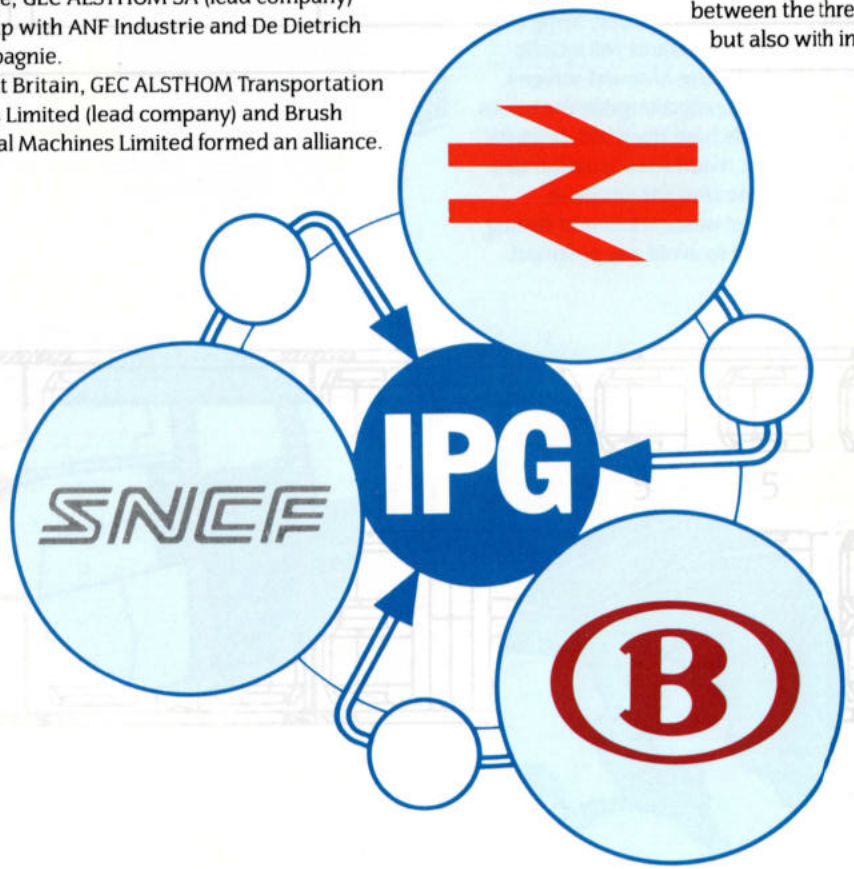
UN MODELE DE COLLABORATION
VOORBEELDIGE SAMENWERKING

SNCF, British Rail and SNCB/NMBS jointly consulted railway industries on the design and construction of a train which will meet all these requirements. Three industrial groups were formed and the lead companies then decided to form a consortium, known as the "Trans Manche Super Train Group (TMSTG)", in order to agree on a design acceptable to all three railway systems.

- In Belgium, BN Constructions Ferroviaires et Métalliques SA (lead company) teamed with ACEC Transport SA.
- In France, GEC ALSTHOM SA (lead company) joined up with ANF Industrie and De Dietrich et Compagnie.
- For Great Britain, GEC ALSTHOM Transportation Projects Limited (lead company) and Brush Electrical Machines Limited formed an alliance.

The three railways have formed a joint International Project Group (IPG). Having defined the specification, with the collaboration of specialist engineers of the three railways, it monitors the development, design and construction of the train units of the high speed train on behalf of the parent railways. It also manages the procurement contract which it prepared in co-operation with the railways' specialists, supervising the application of the specification laid down by the many inter-railway working parties and finalised with the industrial group.

So from start to finish, the realisation of this link depends on close co-operation, not only between the three railways, but also with industry.



THE ENVIRONMENT

RESPECTING THE ENVIRONMENT

RESPECTER L'ENVIRONNEMENT

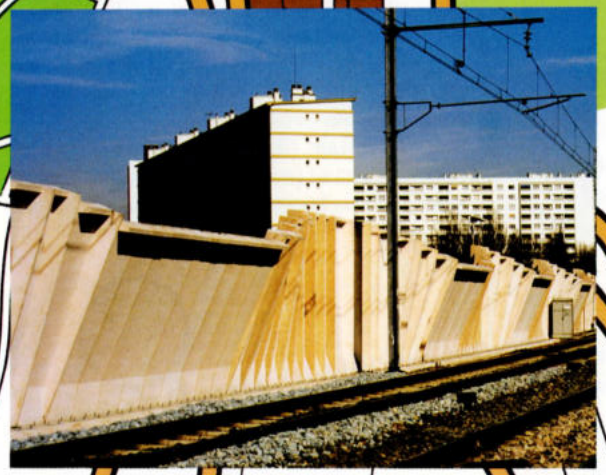
EERBIED VOOR HET LEEFMILIEU

Even though electric trains are recognised as the least polluting form of transport, the designers of the new high speed train were concerned to preserve the quality of the environment in the regions through which it will run.

As far as noise is concerned, the specially constructed high speed track and the suspension systems of the trains are so sophisticated that they eliminate much of the noise.

In planning the new high speed lines, the three railways will take all possible steps to protect the environment, not only from noise, but also visual intrusion where it might affect people living close to the proposed routes. Measures will include extensive tunnelling, the use of sound screens, earth banks and landscaping alongside the tracks.

Very strict standards have been laid down for the construction work to reduce disruption to a minimum. On board the trains themselves, systems for retention of waste water and storing of rubbish are provided to avoid any pollution.



SUMMING UP

RESUME
SAMENGEVAT

- The necessity of high speed travel within the Europe of today is clearly understood.
- From it will come technological advances which will benefit not just the railways and the industries concerned, but above all, the passengers – the citizens of Europe themselves.
- Uniquely in the history of railways, the through-Tunnel high speed train will integrate technical characteristics developed in Britain and mainland Europe. Besides being a model of co-operation, it is the Europe of tomorrow which is being built today, with the common will to succeed in overcoming any differences.
- The whole European Community will benefit, both practically and economically, from the Eurotunnel and the high speed train. The best evidence of this lies in the tremendous human, industrial and financial investment committed to the project by each of the three railway companies.

For further information contact:

External Affairs Office
British Rail Channel Tunnel Project
General Offices
Waterloo Station
LONDON SE1 8SE
ENGLAND

SNCF

Direction de la Communication
SNCF
88, rue Saint-Lazare
75436 PARIS CEDEX 09
FRANCE

Services des Relations Extérieures
SNCB
Rue de France 85
1070 BRUXELLES
BELGIQUE

Externe Betrekkingen
NMBS
Frankrijkstraat 85
1070 BRUSSEL
BELGIE

1. → Communicating door between coaches
Porte d'intercommunication
Verbindingsdeur

2. ▸ Access door to/from platforms
Porte d'accès
Toegangsdeur

3. B Baggage compartment
Compartiment bagages
Bagageafdeling
} 6.4 m²

4. CB *Baggage rack*
Casier à bagages
Bagagerek

5. Airline style seats
Rangées de sièges
Fauteuils achter elkaar

6. Face-to-face seats
Sièges en vis-à-vis
Fauteuils tegenover elkaar

7. Table
Table
Tafel

8. Family compartment
Compartiment famille
Gezinsafdeling

9. Smoking
Fumeurs
Rokers

10. AD Relaxation area
Aire de détente
Ontspanningsruimte

11. WC WC
WC Toilettes
Toilet

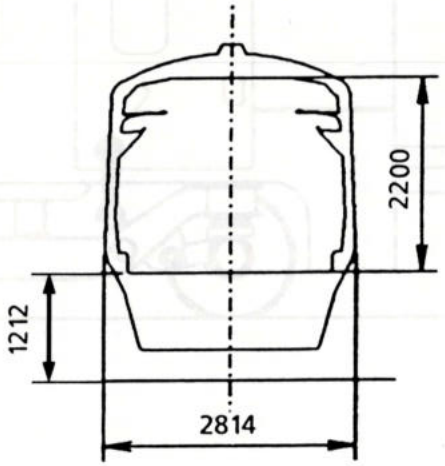
12. N Nursing mother's room
Nurserie
Babykamer

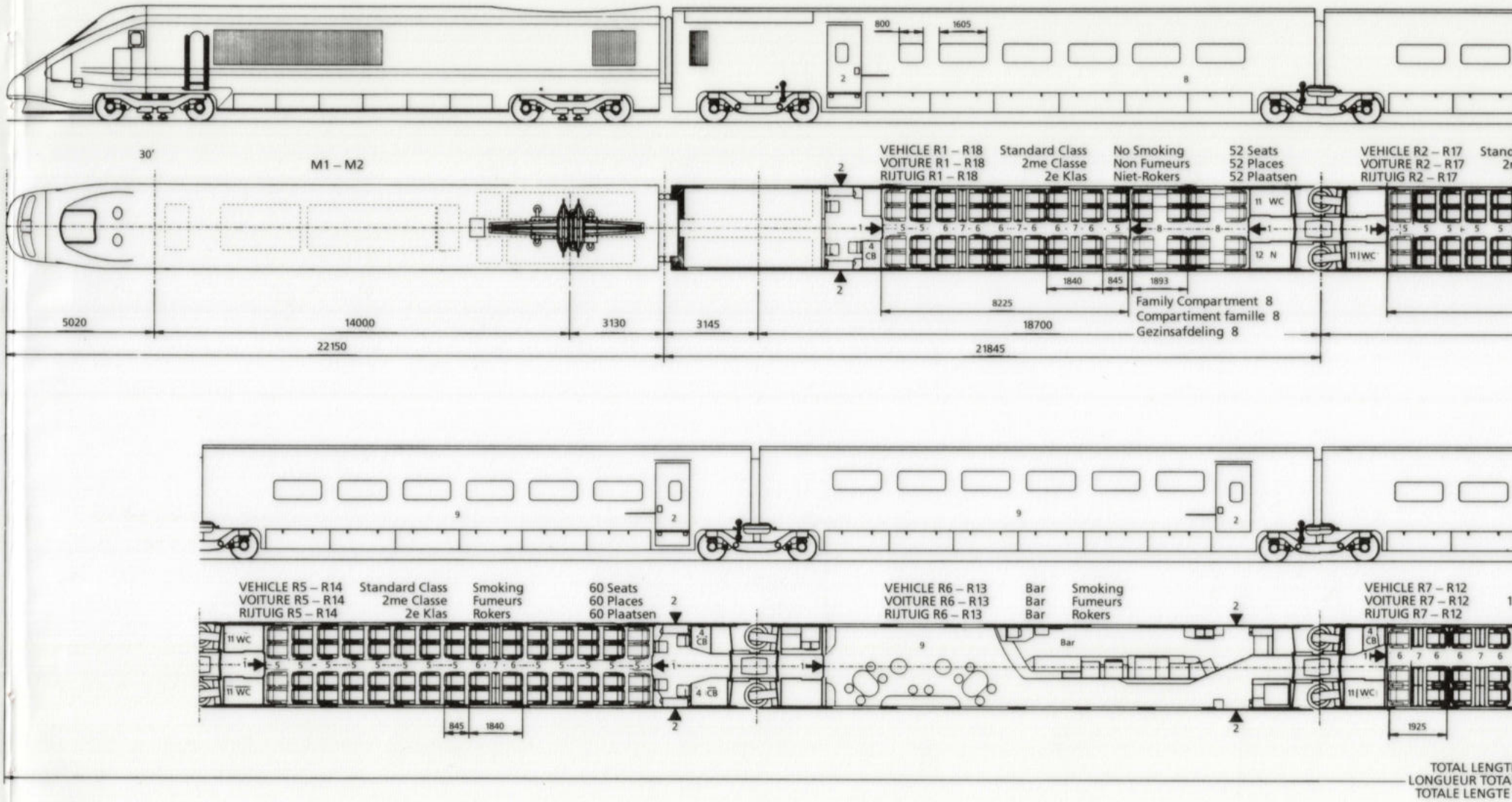
13. H Disabled person's location in saloon
Emplacement pour un handicapé dans son fauteuil roulant
Plaats voor minder-valide in zijn rolstoel

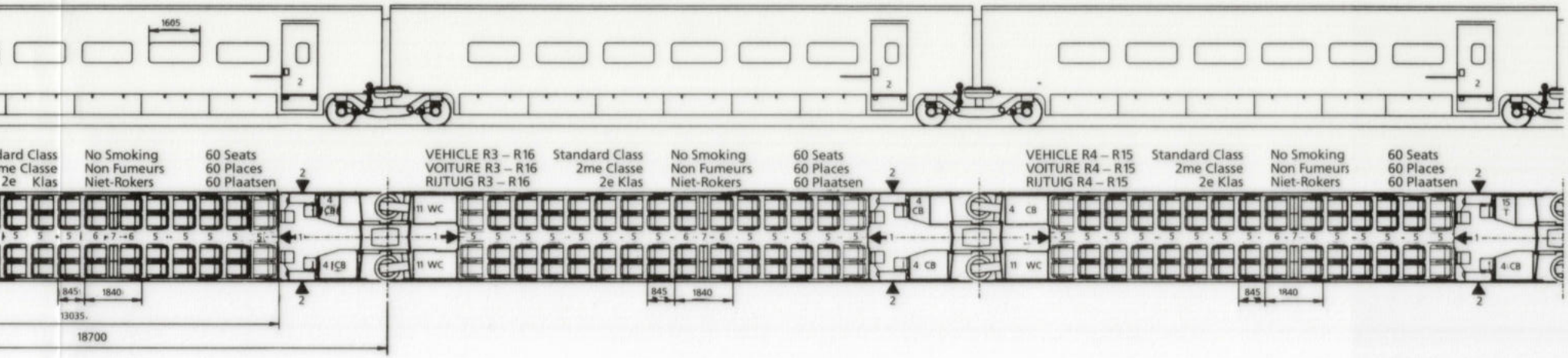
13. CT Special wheelchair for use in the train
Fauteuil roulant permettant de se déplacer dans le train
Rolstoel voor gebruik in de trein

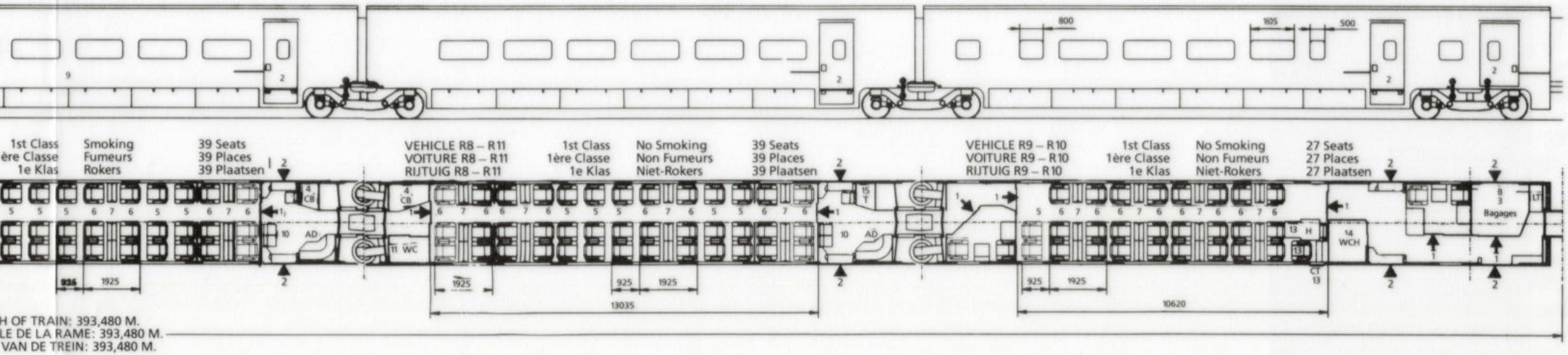
14. WCH Disabled person's WC
WC Toilettes pour handicapé
Toilet voor minder-valide

15. T Telephone booth
Cabine téléphonique
Telefooncel




30'
M1 – M2
VEHICLE R1 – R18
VOITURE R1 – R18
RIJTUIG R1 – R18
Standard Class
2me Classe
2e Klas
No Smoking
Non Fumeurs
Niet-Rokers
52 Seats
52 Places
52 Plaatsen
VEHICLE R2 – R17
VOITURE R2 – R17
RIJTUIG R2 – R17
Family Compartment 8
Compartiment famille 8
Gezinsafdeling 8
5020
14000
3130
3145
22150
21845
18700
8225
VEHICLE R5 – R14
VOITURE R5 – R14
RIJTUIG R5 – R14
Standard Class
2me Classe
2e Klas
Smoking
Fumeurs
Rokers
60 Seats
60 Places
60 Plaatsen
VEHICLE R6 – R13
VOITURE R6 – R13
RIJTUIG R6 – R13
Bar
Bar
Bar
Smoking
Fumeurs
Rokers
VEHICLE R7 – R12
VOITURE R7 – R12
RIJTUIG R7 – R12
TOTAL LENGT
LONGUEUR TOTA
TOTALE LENGTE





H OF TRAIN: 393,480 M.
LE DE LA RAME: 393,480 M.
VAN DE TREIN: 393,480 M.

SNCF