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Subject: 220 kph and 300 kph Differential Analysis

We discussed and analysed your questions about advantages and disadvantages of 220 kph rolling stock in Amsterdam-Brussels trains.

Below you will find a summary of our conclusions, a simple score table, and a list of all the arguments which we checked on relevance, significance and eventually costs.

In **annex A** we included a brief overview of the relevant elements of the NS/KLM bid (passenger flows, comfort levels etc) related to the domestic / international rolling stock choice.

A special problem is whether all data from the bid are considered to be binding. For example one can imagine that domestic rolling stock could have a smaller seat pitch to increase passenger capacity as an advantage. However in the bid is stated that seat pitch is the same in both types of rolling stock. Our conclusion is that this might be an advantage, but it is irrelevant because it will not happen.

Summary

A. Brussels service with domestic rolling stock 220 kph, Paris service with international 300 kph rolling stock

Summary:

- Advantages for TOC is more flexible and larger domestic fleet, and lower cost for Brussels trains. Emphasis is on domestic service integration.
- The domestic rolling stock is more flexible towards growth, which is important because of the predicted growth on Schiphol-Brussels.
- Disadvantage for TOC is less flexible international operations, and different service level and travel speed on Amsterdam – Brussels between 2 trains in one hour.
- Advantage for Infrastructure Manager in the Netherlands, Belgium, or France: none
- Disadvantage for Infrastructure Manager in the Netherlands and Belgium: capacity problems on Amsterdam-Schiphol and Brussels north-south because of 10' timing difference between Paris and Brussels trains

B. Brussels and Paris service both with 300 kph rolling stock

Summary:

- Advantages for TOC is more flexible and larger international fleet, and option to optimise service and fleet management on Amsterdam-Paris route.
- Disadvantage for TOC is more expensive rolling stock on Brussels service, and potentially a requirement for more units because of lower capacity of 300 kph stock.
- Advantage for Infrastructure Manager in the Netherlands, Belgium, or France: good use of restricted capacity and options for optimising south of Brussels.
- Disadvantage for Infrastructure Manager in the Netherlands and Belgium: none.

Score Table

In the table below are included the arguments that we assessed to be relevant or significant. The assessment results are listed below the table.

	220 kph Asd Bxl	300 kph Asd Bxl
Advantage	<p>Lower Capital costs (4 mio € / yr) Lower Maintenance costs (1,2 mio € /yr Lower Energy costs (1,2 mio € /yr)</p> <p>Fleet flexibility for growth on Schiphol – Belgium.</p> <p>Easier domestic or Benelux integration</p>	<p>Optimal use of infra capacity in NL, Belgium and France.</p> <p>Good for integrated service and market capture along Amsterdam Paris. (international integration)</p> <p>Uniform international service, fares and yield.</p>
Disadvantage	<p>To slow timing, difficulty to get path's in NL and Belgium. High infra capacity costs. (relation to State path guarantee?)</p> <p>All domestic trains adapted for 3KV and other technical requirements in Belgium. (>0,5 mio € per unit)</p> <p>Time table and service aspects differ every 30' between trains to Brussels.</p>	<p>Higher costs (Capital 4 mio €, Maintenance 1,2 mio € and energy 1,2 mio € per year)</p> <p>Traffic growth accommodation only by adding a 2nd unit; low flexibility against growth</p> <p>Less suitable for domestic NL integration?</p>

Assessment of arguments, facts and reference:

- **Differences in rolling stock cost:**
 - Based on rolling stock tender and Mississippi bid.
 - Mississippi priced every unit + 30% for development costs, we included this.
 - We used average leasing costs from Mississippi bid as a comparator.
 - The difference in investment between the two options is in total 84 million Euro, the NL share is 42 million Euro.
 - The difference in annual leasing costs is in total 8,37 million € , and NL share is 4,18 million € / year
 - For maintenance cost, we used Rolling Stock tender life cycle data. (in the Mississippi bid the costs are equal) We calculated a relative difference of 30% in annual maintenance costs. We applied this % to the Mississippi business model data. The effect is 1,2 million € per year for the NL TOC, and the same for NMBS.
 - For energy cost we compared data from the rolling stock tender and the data in chapter 7 of the Mississippi bid. The result is 0,3 €/ train km difference. The total effect is estimated at 1,4 million € per year.
 - Organisation of maintenance in Brussels / Forest and Paris Le Landy might result in reduced maintenance costs if only one type is used.
 - Maintenance of small fleet may be more expensive (i.e. not unit cost but the need for an additional train on a small fleet size), this argument is valid for both fleets.

- **Difference in rolling stock capacity:**
 - In the Mississippi bid capacity of both types is almost the same (518 / 550 seats). The 220 units can be enlarged by adding extra trailers. So initially there is no difference, but in 2020 there will be different requirements for the number of sets for both alternatives.
 - For the 220 kph rolling stock there is a scope for 'commuter style' seating giving higher capacity trains for a given fleet size (i.e. lower cost per seat) However in the binding bid of Mississippi they promise the same standard for both types. Therefore at this moment we consider this to be a non argument.

- **Difference in operational fleet flexibility**
 - For base case + variant 6 and 4 a minimum (the minimum is as tight as the bid is) total fleet of 26 units is needed in 2006, the fleet size for 220 /300 is:
 - 18 of 220 kph stock and 8 of 300 kph stock with 220 for Brussels
 - 14 of 220 kph stock and 12 of 300 kph stock with 300 for Brussels
 - For more realistic / less tight and including growth to 2020 the numbers are:
 - 26 of 220 kph stock and 9 of 300 stock with 220 for Brussels
 - 21 of 220 kph stock and 14 of 300 stock with 300 for Brussels
 - In case of operating 300 kph fleet for both Brussels and Paris service, there is an option to save one unit by alternating turnaround in Amsterdam.
 - The difference between the two options is not significant regarding operational flexibility.
 - A bigger 220kph fleet can give more domestic options to the operator (NSR) e.g. :
 - part of a larger fleet replacement programme
 - extend domestic services beyond Breda /Amsterdam CS to other domestic destinations

The difference in fleet size between Brussels 220 or 300 is only 4 or 5 units. The argument is also not significant.
 - If 300 kph stock is used for Brussels , trains can be added to the Thalys network high speed fleet requirement, therefore capturing economies of scale of a larger fleet size (e.g. utilise existing maintenance facilities at Forest depot)

- **Relation between fleet size and unit costs.**
 - The fleet size differences mentioned above are too small to predict any significant series effect on capital cost or maintenance practice
 - However if NSR integrates the shuttle services in the HRN IC network, they can achieve more significant reductions in unit costs. We estimated a total fleet of 160 cars (is 40 units). The difference between first 10 units and 2nd 10 units is minus 15% in the rolling stock tender. For 20 – 40 units we expect some further reduction. The difference between Brussels 220 or 300 kph is only 4 or 5 units, which in our opinion makes this a non issue.
 - There is a relation between fleet size and maintenance costs (special equipment needed for a small fleet only and inventory costs). We consider this to be not a relevant issue as long as NS is the preferred bidder. For foreign TOC's however this is a significant issue.

- **Operational integration.**
 - **Integration of High speed services Germany, Belgium, Netherlands, France and England** to maximise benefits for all partners.
 - One fleet of 300 kph stock to Brussels and Paris gives opportunities for efficient use of paths between Brussels and France destinations. All kind of combinations with other lines might deliver large market shares and revenues at low costs for fleet and infrastructure.
 - **Integration of 200 /220 shuttle networks between Belgium and the Netherlands** to optimise Benelux benefits. Traffic volumes north of Brussels are higher as volumes on Brussels - France.
 - Using 220 stock to Brussels can enable combinations with NMBS 200 kph services on Belgium HS lines.
 - **Integration of Brussels service in Dutch IC network.** In this scenario Brussels and Antwerp are treated as important business and leisure destinations within a Dutch timescale.
 - Using 220 stock to Brussels enables extension / or integration with NS IC network. This argument is not been used till now.
 - In the past the Brussels –Breda – Arnhem / Nijmegen service was assumed to run at 220 kph.

- **Technical requirements fro 220-Brussels rolling stock.**
 - The rolling stock has to be equipped with 3KV traction, this was included in the Siemens bid, but not in other rolling stock bids. If you want to incur all benefits of fleet flexibility then this extra equipment is needed for the whole domestic fleet, including eventually extensions on the HRN network. Extra costs may be 0,5 million €/unit, extra weight might also be a problem.
 - Other extra equipment requirements like APT systems are less significant.

- **Difference in Time table construction and Infrastructure capacity caused by speed difference.**
 - In agreements between Railned and NMBS / SNCF is assumed that there are 2 HST 300kph paths / hour with fixed 30' intervals on Amsterdam-Brussels-Paris. This arrangement is good for line capacity all along the HSL Amsterdam Paris and especially for capacity in Paris, Brussels and on Schiphol – Amsterdam. (Route capacity higher with all trains operating with similar performance)
 - On Brussels Paris these paths are used today (peak 30' interval). If 300 kph rolling stock is used on Brussels – Amsterdam, these trains can be combined with the Brussels-Paris service. The result is a 30' Amsterdam Paris peak service with efficient use of infra capacity in Brussels and in France.
 - We checked time table calculations for 300 and 220 rolling stock. Conclusion is that there will always be a difference of about 10 minutes on Amsterdam-Brussels. The timings in the ITT are more realistic for path reservation as the timings mentioned in the Mississippi bid. (see memo about timings and time table)
 - If 220 kph rolling stock is used for Amsterdam Brussels service, the interval between trains is 30/30 at one end, and 20/40' at the other end. It will be difficult to get a reservation for such paths, because it costs 1 or 2 paths of domestic / local services on Schiphol- Amsterdam and in Brussels. (Is this included in State guarantee?) It is not included in Belgian capacity plan which is based on fixed 30' intervals (on Dutch and French border).

- **Service aspects**

- The 300 kph trains have a bar corner for economy passengers, and on seat catering for business class. The 220 kph domestic trains have on seat drinks for business class and automated vending machines for economy.
- The fare level and fare structure for passengers to Antwerp and Brussels is the same according to the Mississippi bid. Combined with the 10 minutes time difference this might not be sustainable.
- The reservation system and passenger information systems are – in the bid – the same for both types of rolling stock. This means that the complete domestic fleet will have the same facilities as the 300 kph fleet.
- In Holland domestic passengers will use both trains between Rotterdam and Amsterdam. We do not know whether this happens also in Belgium between Antwerp and Brussels. For these cabotage passengers it will be difficult to understand what is the difference between domestic, domestic to Brussels and international trains is.
- There is no difference in yield management for 220 or 300 kph trains to Brussels. Probably yield is not an argument to run either 300 or 220 kph trains.

General Remarks.

Our assessment of all factors makes us think that the most important question is whether the Amsterdam Brussels is an (important) part of the PBK(A) HS system or more part of the Dutch IC or Benelux IC system. The NS bid is focussing on the domestic side of this connection. In our opinion it is important to understand the French and Belgian policies (commercial and for infra capacity) before any choice is made.

The differences we found for costs and quality are less important and have less impact than the answer to this strategic question.

ANNEX A

Rolling Stock Fleet International in NS_ KLM bid

If we accept all statements from the Mississippi bid the difference / arguments for 220/ 300 rolling stock choice are:

1. In the Mississippi bid four different fleet options are considered (A – D) , the argument to have 220 stock for Brussels service is : “ for Brussels we need 220 stock to achieve the 93’ travel time”.
2. The comfort in the 300 and 220 trains is the same, only catering is different. Seat pitch is 950 and 900 mm for both types.
3. Maintenance costs are the same per km for both trains.
4. Energy costs are slightly different.
5. Seat capacity is almost same (518 / 550)
6. Timings on Amsterdam-Brussels are equal / can be equal.
7. Capital costs are different: 300km= 38 mio Euro, 220 is 19 Mio Euro.
8. Ticket prices, yield management etc is the same. Of course Paris passengers will prefer a 300km booking because it is without change. For Brussels and Antwerp customers there is no difference between the 2 types.

If we take a closer look at passenger volumes and seat capacity, we get:

C. Passengers and seats per Working Day in 2020								
	Passengers				Seats			
	Asd-Paris	Asd-Bxl	Int.total	Domestic	Asd-Paris	Asd-Bxl	Int.total	Domestic
Asd-Schiphol domestic				11.685				17.600
Shl-Rtd domestic				21.549				17.600
Asd- Shl internat	2.907	4.775	7.683		16.576	17.600	34.176	
Shl –Rtd internat	3.579	9.233	12.812		16.576	17.600	34.176	
Rotterd.-Antwerp	5.242	20.173	25.415		16.576	17.600	34.176	
Rotterd. Brussels	5.242	11.757	16.999		16.576	17.600	34.176	
Brussels Paris	5.242		5.242		16.576	17.600	34.176	

The volume of Antwerp Passengers and Brussels Passengers requires seats in both services (Brussels and Paris service), and cabotage for domestic passengers is needed on Shl-Rotterdam.

With variant 6 there is no more need for cabotage, the 4 domestic trains per hour have enough capacity, and could even be 480 instead of 550 seats.

The table above does not clearly demonstrate why 220 stock for Brussels is necessary.

The only remaining argument is that the 220 type is cheaper. The remaining difference is the service for Brussels and Antwerp Passengers with less comfort and 7 or 10 minutes time loss.

There is no evidence of any other advantage, like integration in other services. There never was any idea to extend the Brussels service beyond Amsterdam.

The extra Amsterdam- Breda-Brussels train (the slow Brussels connection from the 1999 bid) is a candidate for extensions to east NL, or to the Hague and has always been planned with domestic stock.

Extensions of HST services like in Belgium to Oostende with Thalys, have never been in the NS scope.

Cabotage revenue sharing GVO

Vraag van Danielle was (denk ik):

Hoeveel is ongeveer de waarde van domestic cabotage in NL en B vallend onder artikel 6, 1 GVO.

Analyse:

Ik heb in beschouwing genomen :

- Internationale treinen op Schiphol – Rotterdam en Antwerpen – Brussel
- Internationale treinen Breda – Brussel (waarvan een paar Gvc – Bxl).

Amsterdam Schiphol en Brussel Noord – Brussel Zuid heb ik als te veel detail buiten beschouwing gelaten.

Voor Schiphol – Rotterdam hebben we redelijk veel gegevens voor 2010.

Op werkdagen in 2010 geldt:

- De 4 shuttles per uur hebben in het drukste uur een overbezetting van 125 reizigers per trein.
- Gemiddeld over de dag is de shuttle bezettingsgraad 60% (200 stoelen vrij per trein).
- De 2 internationale treinen hebben in het drukste uur 50% vrije stoelen (250 per trein volgens bod, bij een Thalys slechts 80 stoelen vrij)
- Gemiddeld over alle uren van de werkdag is de bezetting van de internationale treinen 30%.

Conclusie:

- Tijdens de spits uren is cabotage nuttig / aantrekkelijk,
- buiten de spitsuren is het niet nodig, de shuttles hebben genoeg capaciteit.
- Als gemiddeld 15% van de lege stoelen via cabotage gevuld worden is de waarde van het vervoer tegen gemiddelde yield volgens bod circa 13 mio euro per jaar.

Voor Antwerpen – Brussel in de 2 internationale treinen uit Amsterdam geldt op werkdagen in 2010:

- In het drukste uur is de bezetting door reizigers van / naar Nederland uit bod Newco 40%
- Gemiddeld over een werkdag is dat percentage 25%.
- Afhankelijk van het type materieel zijn er 300 (shuttle) tot 200 (Thalys) stoelen vrij voor cabotage verkoop. De internationale reizigers van Antwerpen naar het zuiden moeten hier nog van afgetrokken worden.
- Voor Belgisch binnenlands vervoer missen we gegevens over omvang en dienstregeling.
- Als gemiddeld 15% van de lege stoelen via cabotage bezet worden heeft dat een waarde van 10 mio euro per jaar. Hierbij is de gemiddelde yield uit het Newco bod voor Schiphol – Rotterdam gecorrigeerd voor kilometers gebruikt.
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Voor Antwerpen Brussel en Den Haag Breda in internationale treinen (Den Haag) Breda Brussel wordt het helemaal gokken bij gebrek aan gegevens.

- Op Antwerpen Brussel in het drukste uur is de bezetting door reizigers van / naar Nederland uit bod Newco 20%
- Gemiddeld over een werkdag is dat percentage 10%
- Het vervoer van Den Haag is ongeveer even groot als het wegvallende vervoer uit Rotterdam in de base case. Den Haag speelt geen rol op Antwerpen – Brussel.
- Den Haag Breda domestic heeft een waarde van maximaal 1 mio euro per jaar..
- Afhankelijk van het type materieel zijn er 450 (shuttle) tot 320 (Thalys) stoelen vrij voor cabotage verkoop op Antwerpen - Brussel. De reizigers van de kleine Belgische stations ten noorden van Antwerpen moeten hier nog van afgetrokken worden.
- Voor Belgisch binnenlands vervoer missen we gegevens over omvang en dienstregeling.
- Als gemiddeld 15% van de lege stoelen via cabotage bezet worden heeft dat een waarde van 7,5 mio euro per jaar voor het Belgische deel en 0,3 mio voor het Haagse deel. Hierbij is de gemiddelde yield uit het Newco bod voor Schiphol – Rotterdam gecorrigeerd voor kilometers gebruikt

Conclusie:

- Als op alle cabotage secties 15% van de lege stoelen via cabotage wordt verkocht is het GVO sharing resultaat:
 - o Amsterdam – Brussel / Parijs
 - Schiphol Rotterdam 13 mio
 - Antwerpen Brussel 10 mio
 - o (Den Haag) Breda Brussel
 - Den Haag – Breda 0,3 mio
 - Antwerpen – Brussel 7,5 mio
- Onder al mijn aannames is het NL deel dus 13,3 en het B deel 17,5 mio. Gezien gebrek aan B gegevens en de lucht in het Newco bod is elke andere uitslag denkbaar en verdedigbaar.
- Bij de huidige Benelux dienst is de bezetting op Schiphol Rotterdam en Antwerpen Brussel hoog > 70%, op het grens baanvak laag (30%).
- In het Newco bod is Rotterdam Antwerpen het drukste baanvak met 100% bezetting in de spits en 60% gemiddeld op een werkdag.
- Mij dunkt dat er niks op tegen is dat beide ondernemers zowel de risico's als de opbrengsten delen, als ze dat beide slim doen verdienen ze het meest.
- Aan de andere kant is het voor Newco eenvoudiger om geen cabotage te hebben op Schiphol – Rotterdam vanwege problemen met economy klanten die gereserveerde stoelen willen bezetten. In dat geval hebben ze natuurlijk ook geen recht op het Belgische deel.

Laat partijen mijn sommetjes zelf maar maken en als ondernemers zaken doen. Ik denk dat het niet om grote bedragen gaat tussen de GVO partners, het is wel een stimulans voor Newco om meer ondernemersgedrag te gaan vertonen. Ze zouden er zelfs nog beter op kunnen worden.