Hanzelijn, van idee tot evaluatie

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Samenvatting

Hanzelijn, van idee tot evaluatie

De Hanzelijn is de 50 kilometer lange spoorwegverbinding tussen Lelystad Centrum en Zwolle die sinds 9 december 2012 is opgenomen in de dienstregeling. Op deze verbinding zijn twee nieuwe stations geopend: Kampen Zuid en Dronten. De bouw van de lijn ging officieel van start op 30 januari 2007. Het doel van de Hanzelijn is om het noorden van Nederland sneller te verbinden met de Randstad. Voor dit doel waren lang voor de bouw van de Hanzelijn meerdere opties mogelijk. Meerdere varianten met verschillende verbindingen, snelheden en treintypes zijn bestudeerd en doorgerekend. Omdat deze studies aantoonden dat de Hanzelijn tot reizigersgroei zou leiden, is in 2003 besloten om de Hanzelijn te bouwen. NS heeft onderzocht wat de implicaties zouden zijn voor het gehele spoornetwerk en hoe de dienstregeling gereconstrueerd moest worden om de klantvraag het beste te bedienen. Hierbij zijn de knooppunten Zwolle, Amersfoort, Utrecht en Almere in detail bestudeerd. Met de ingebruikname van de Hanzelijn is één derde van het Intercity netwerk in Nederland veranderd.

Het uiteindelijke resultaat van de Hanzelijn zoals in gebruik genomen eind 2012, is geëvalueerd door de prestaties van de nieuwe lijn te toetsen aan diverse studies die gedaan zijn voor de bouw en ingebruikname van de Hanzelijn. Voor deze evaluatie is na ingebruikname data verzameld, onder andere met tellingen en enquêtes op de nieuwe stations en in de treinen. Deze gegevens tonen aan dat de Hanzelijn grotendeels presteert zoals verwacht. Reizigers vertonen nieuw routekeuzegedrag conform prognose waardoor belastingen op de omliggende verbindingen veranderen. Op de Hanzelijn is het reisgedrag grotendeels naar verwachting. Op de Hanzelijn worden veel nieuwe reizen gemaakt en reizen veel nieuwe treinreizigers die voorheen reisden per bus of auto. Opvallend is dat op zaterdagen meer reizigers via de Hanzelijn reizen dan op dinsdagen, dat Kampen Zuid achterblijft op de prognoses en dat Dronten juist boven verwachting presteert. Meer dan driekwart van de treinreizigers op de Hanzelijn geeft aan via de Hanzelijn te reizen omdat de verbinding is verbeterd (sneller, minder overstappen).

Geconcludeerd kan worden dat de Hanzelijn goed presteert en het product van de Nederlandse Spoorwegen heeft verbeterd. Meer treinreizen worden gemaakt en nieuwe treinreizigers zijn aangetrokken door de snellere en betere verbinding.

1. Introduction

The Hanzelijn is a 50 kilometer long new track between Zwolle and Lelystad and provides a direct rail link between Flevoland and the north of the Netherlands. The Hanzelijn is being operated from December 9 2012 and contains two new stations: Dronten and Kampen Zuid. January 30 2007 was the official starting moment of the construction works. Long before this moment, ideas were generated, plans were made and calculations have been done. This paper describes the complete Hanzelijn project from the view of the train operating company. The paper will start from a historic perspective: What were the initial ideas? What were the alternatives? Hereafter, the timetable studies will be described. This will be followed by an in-depth analysis of the current timetable. Starting with the design and ending with an evaluation of the expectations based on real-time counting and survey data. The paper will end with conclusions about the realization in respect to the initial ideas and expectations.

Figure 1. Picture of the route of the Hanzelijn

2. History

In the last century, it was questioned how to make public transport better to increase modal split with respect to cars. Especially a fast new connection to the northern part of the Netherlands seemed to attract more passengers. The north is an economic less important part of the country, but new transport possibilities could bring more wealth. New options were made possible by the Flevopolder, which was newly drained between 1955 and 1968 in the former Zuiderzee.
There were two options for a faster connection to the north: The Zuiderzeelijn and the Hanzelijn (Figure 2).

Figure 2. Schematic picture of the plans of the Zuiderzeelijn and the Hanzelijn

Both options had their advantages. The Zuiderzeelijn would be connected to Groningen directly; the Hanzelijn would get a connection with Zwolle in the east. The most high tech variant for the Zuiderzeelijn contained a magnetic levitation train line that would decrease the journey time between Amsterdam and Groningen a lot. However, this option was too costly and was therefore not calculated in detail. In the end it turned out that for the Zuiderzeelijn a lot more distance had to be covered by new rail, making this line far more expensive compared to the Hanzelijn and therefore not feasible.

In the year 1996, the Dutch government gave order to conduct a study on different variants for the timetable of the Hanzelijn, which name relates to the Hanze cities, important trading cities in the Middle Ages. The different variants deviated on the maximum speed for trains that run over the Hanzelijn, the train types and the connection with east of the Netherlands.

Concerning speed, the study made a distinction between running 160km/h and running 200km/h high speed trains. The travel reduction from Amsterdam to the northeast of the Netherlands would be 7 minutes when the speed would be 160km/h and 13 minutes when the speed would be 200km/h. Running 200km/h trains would lead to 14% more trips than running trains with 160km/h. Because of the higher costs for both trains and railway security systems, running trains with 160km/h would lead to a higher return on investment. In the end the line is built for 200 km/h, but used at the moment with the maximum speed of 140 km/h. Limitations of the security system prohibit trains to run faster than 140km/h. However, because of other improvements in the timetable, the current reduction in journey time between Zwolle and Amsterdam South is also 7 minutes.

Currently, NS has a two train type system: Intercity and Sprinter. Intercitys are fast trains and Sprinters are trains that stop at every station. NS chose to run Sprinter trains from Zwolle all the way to Amsterdam to give a lot of travellers a direct connection to the capital of the Netherlands.

For the connection with the region in the north of Zwolle, it was obvious that all trains should go on to Leeuwarden and Groningen. Variants with a train running over the Hanzelijn and further to Enschede in the east of the Netherlands and Emmen in the northeast were studied. The effect on the occupation rate for the trains on the Hanzelijn would be marginal. In the end, also the number of extra travellers that would choose the train for their journey was minimal with this variant. This was for NS the reason not to use the Hanzelijn for journeys directly to Emmen and Enschede.

All variants were compared to a situation without the Hanzelijn. This comparison showed that the Hanzelijn would have a positive effect on the journey time of a lot of travellers and also that the Hanzelijn, indirectly, would have an effect on almost one third of the trips being made in the Netherlands.

Because the studies showed that the Hanzelijn would lead to growth, the decision to build the Hanzelijn was taken in 2003. In December 2012, NS started running trains with passengers over the Hanzelijn. The line was ready in time and the costs were kept within

budget. For the Zwolle station the story is different. Because the station was not ready in time and will not be ready for the next few years, the stop time for trains is a lot longer than previously expected.

Between Lelystad and Zwolle there are two new stations: Dronten and Kampen Zuid. The new line has no level-crossings. Three important crossings are a bridge over a highway, a tunnel and a newly build higher bridge. Both can be seen in Figure 1.

3. Implication of the Hanzelijn on the network of Dutch Railways

With the implementation of the Hanzelijn, the most important question for train operating company NS was: which reconstruction of the network will fit best to the demand of our customers? For that purpose the first question is: What will be the new travel demand? **Fout! Verwijzingsbron niet gevonden.** shows that the Hanzelijn and the Veluwelijn are important routes from the North of the Netherlands to what we call the Randstad, the more dense part of The Netherlands with the four big cities (Amsterdam, The Hague, Rotterdam and Utrecht).

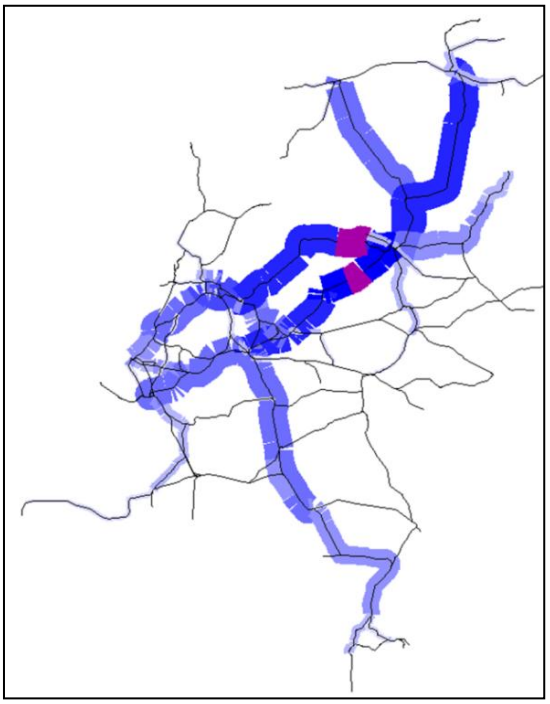

Figure 3. Flow bundle for Hanzelijn and Veluwelijn

To illustrate the question of the routing of the trains, we will first show the old structure of the Intercity network of the northeastern part of the Netherlands (Figure 4). An important junction for the northeast Intercity service is Amersfoort. By switching directions of the trains we make hourly direct services. In general, NS runs half-hourly Intercity-services. The second important element of the old situation is that the Intercity-trains are joined or split in Zwolle. The Groningen-part and the Leeuwarden-part run combined to Amersfoort and further on to Utrecht or Amsterdam. In Utrecht the parts for The Hague and Rotterdam are also split and joined. Because there are more travelers in the Randstad the Intercity service around Utrecht is every 15 minutes.

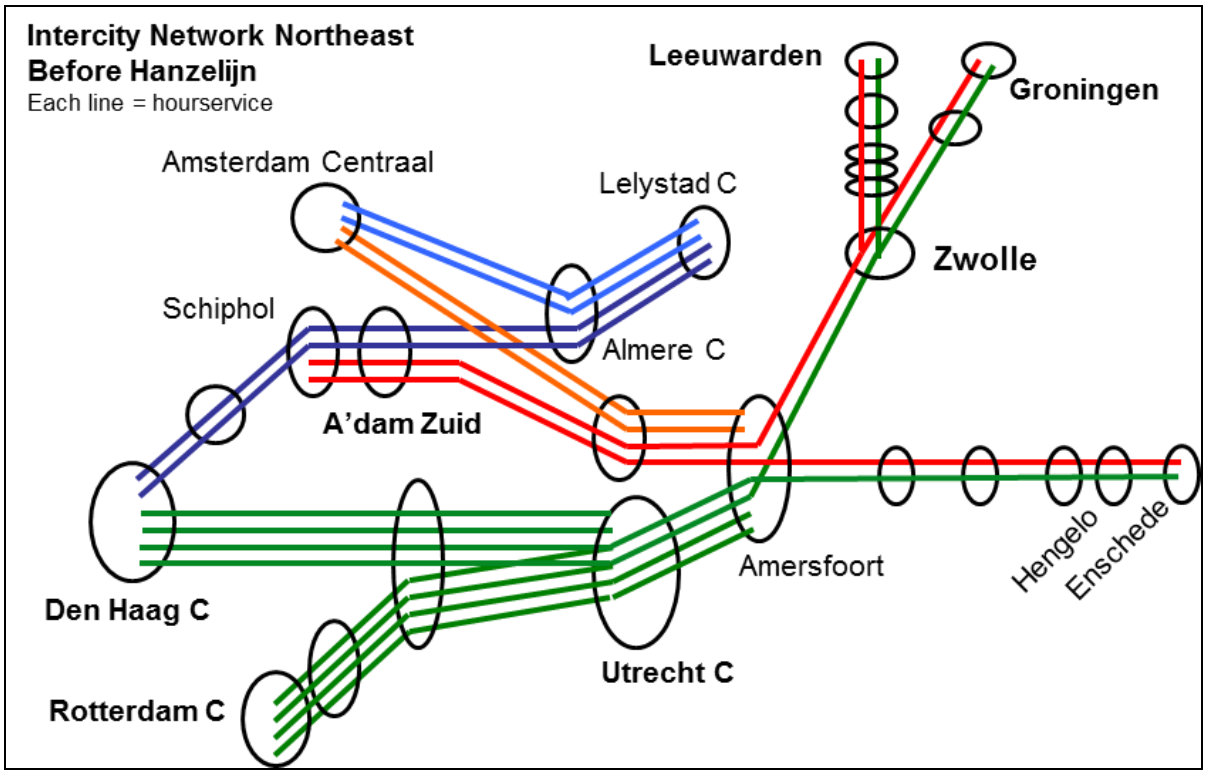

Figure 4. Intercity network northeast before introduction of the Hanzelijn

In the new situation there are two routes to the Randstad: via Almere and via Amersfoort. The Intercity-trains do not split and join anymore, but now stand cross-platform in Zwolle and Utrecht for an easy exchange of passengers. To make this possible an extra platform has been built in Zwolle.

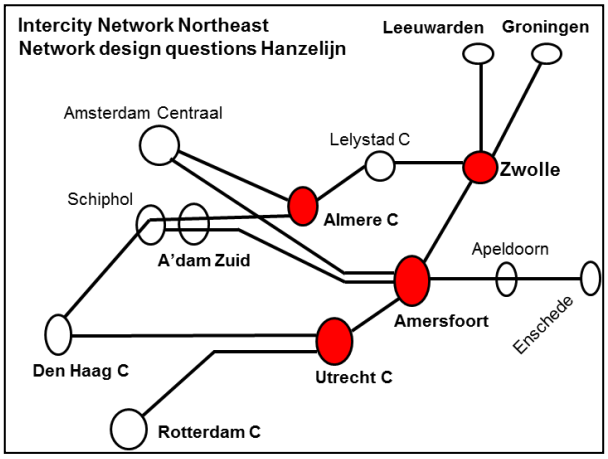

Figure 5. Question points in Hanzelijn network design

To get to this final time table schedule, some specific decisions were made. Below are the most important questions which had to be answered for the design of the new Intercity network. First a picture of the corridors around the Hanzelijn is shown. We refer to these corridor names in the remainder of this paper.

Figure 6. Overview of the corridors around the Hanzelijn

3.1 Zwolle: in corridors or alternating?

Zwolle is an important node in the rail network. Each half hour, trains arrive at Zwolle from eight directions with connections in all directions. The Intercitys between the north of the Netherlands (Groningen & Leeuwarden) and the Randstad form the core of this hub. To make optimal use of this node all trains meet in Zwolle at the symmetry moment in the time table, each half-hour. This means that trains in opposite directions meet each other and connections in every direction are made in the node. With the opening of the Hanzelijn the eighth direction is added to Zwolle. With this change, 20% more boarding and alighting passengers and 10% more transit passengers are expected at Zwolle. This makes the network planning in Zwolle more complicated. To make the network easier we considered to run in corridors: every Intercity from Groningen to The Hague (via Amsterdam) and every Intercity from Leeuwarden to Rotterdam (via Utrecht). But the passenger demand is equal for both directions. To serve the passengers and minimize transfers we decided to switch the route of the trains each half hour: In this way you have direct train for the important destinations each hour.

3.2 Almere: direct to Amsterdam Central or to The Hague Central?

The connection from the Hanzelijn via the Flevolijn to the Randstad can be made towards Amsterdam Central station or to Amsterdam South, Schiphol Airport, Leiden and The Hague Central station. The number of passengers travelling towards the last group of stations is on a normal working day four times higher than the number of passengers to Amsterdam Central. Therefore, we decided to run all Intercitys from Zwolle via Almere to Amsterdam South – The Hague. A consequence of this decision is that we do not need a service Zwolle – The Hague over Utrecht anymore.

3.3 Amersfoort: in corridors or alternating?

Amersfoort is an important junction with four directions. In the old situation, Intercitys from Zwolle and Apeldoorn alternated towards Amsterdam and Utrecht with exchanging passengers in a cross-platform situation.

In the new situation the passengers between Zwolle and Amsterdam will travel direct and faster via the new Hanzelijn-route. Therefore, all Intercitys in Amersfoort coming from Zwolle go further to Utrecht and not to Amsterdam anymore. However the passengers from Apeldoorn still want to travel in both directions: Amsterdam and Utrecht. There we have a problem: you cannot run simultaneously with two trains to Utrecht en no train to Amsterdam. We find a solution by shifting the trains from Apeldoorn with a quarter of an hour. With the four Intercity trains to Utrecht it is possible to run two from Zwolle, one from Apeldoorn and one starting in Amersfoort with connection to Apeldoorn.

These adjustments also had consequences for the time table and connections in the eastern part of The Netherlands.

3.4 Utrecht: still splitting and joining?

As long as we can recall the Intercity trains between Amersfoort and The Hague and Rotterdam were split and joined in Utrecht Central station. Passenger flows towards both destinations are about equal. Because trains are not split and joined anymore in Zwolle, trains are shorter and cannot be split anymore in Utrecht. Besides, Zwolle – The Hague is now a direct connection via the Hanzelijn. Therefore, all Intercitys from Zwolle via Utrecht go to Rotterdam with a subsequent transfer in Utrecht to The Hague. In the other quarters of an hour the Intercitys from Apeldoorn and Amersfoort go to The Hague with a switch of trains to Rotterdam. Thus, quarter Intercity services are offered from Utrecht towards The Hague and Rotterdam.

With these four answers the new Intercity situation could be drawn (Figure 7). Because of the cohesion in the network, the changes for the Hanzelijn reach far from the new line itself. One third of de Intercity Network in the Netherlands is changed.

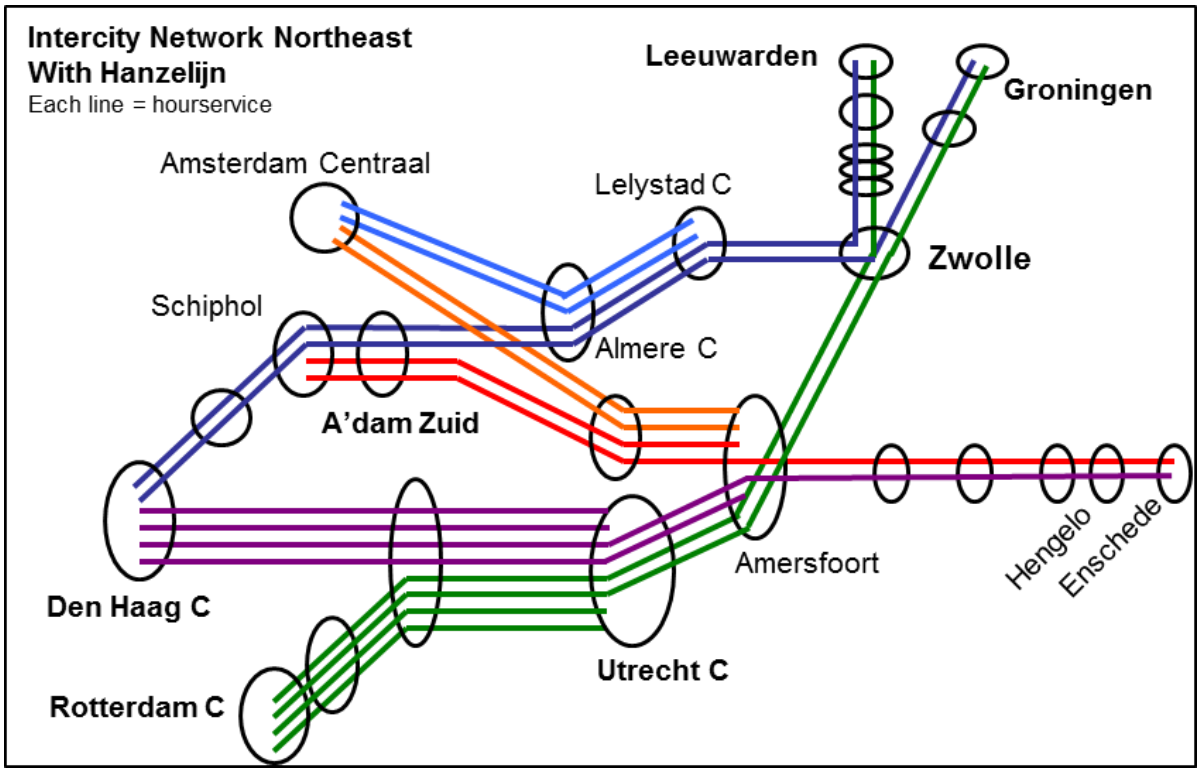

Figure 7. Intercity network northeast after introduction of the Hanzelijn

4. Expectations and Evaluation

With the opening of the Hanzelijn and the major changes in the time tables, passengers' flows and route choices are expected to change drastically. Therefore, forecasts were made and expectations were formulated in various stages of the project. These expectations and forecasts were evaluated with the use of multiple sources a few months after opening. Sources of NS were used, such as measurements of numbers of travelers collected periodically in trains and smartcard (OV-chipkaart) data. In addition, research has been done at the new stations and in all trains on the Hanzelijn by counting and surveying. Travelers at the new stations were counted on a Tuesday in January 2013 and counted and surveyed on a Tuesday in April 2013. At Dronten 414 and at Kampen Zuid 285 useful surveys were taken. Travelers in the trains, Intercitys and Sprinters were counted and surveyed on a representative Tuesday and Saturday in April 2013 (no holidays or big events and no disturbances or major delays in the schedule). In this research 2,546 useful surveys are taken, 1,693 on Saturday and 853 on Tuesday. Tuesdays can be generalized to an average workday, with the notion that Tuesdays are relatively busy workdays. The Saturday data cannot be generalized to an average weekend day, because Saturdays and Sundays differ substantially. Expected is that on Saturdays more trips are made for working purposes and on Sunday more students will travel via the Hanzelijn back to their study city.

4.1 Route-choice

The most important effect of the Hanzelijn is the rerouting of passengers in the network: many people will take another, faster or direct route. In **Fout! Verwijzingsbron niet gevonden.** the expected differences in passenger flows between 2013 and 2012 are

visualized. It is expected, with a TRANS timetable-study done in 2012, that after opening the Hanzelijn, about one-third of all travelers from Zwolle will travel in the direction of Lelystad (Hanzelijn) and two-third will travel in the direction of Amersfoort. In this way, the Veluwelijn and Gooilijn will be less stressed, and the Hanzelijn and Flevolijn will increase in number of passengers. This shift is based on changes in travel time, frequency, transfers, and waiting time. In particular, travelers with new direct routes are expected to shift their route via the Hanzelijn.

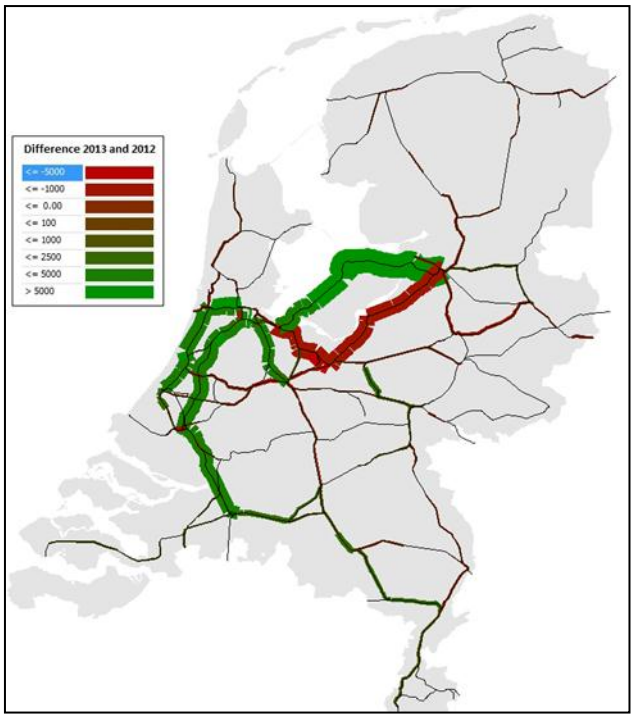

Figure 8. Forecasted difference 2012-2013 in number of travelers on a workday (source: NS, VISUM)

The realized route-choice behavior of travelers appears to be in line with the forecasted shift from Veluwelijn to Hanzelijn. On the Veluwelijn, the amount of travelers' kilometers dropped significantly, the remainders are approximately two-third of the travelers kilometers compared to the year before opening the Hanzelijn (index 0.65). As a result the Gooilijn also drops (0.74). In addition, the Kamperlijn, a small peripheral line between Zwolle and Kampen also has a decrease in number of travelers due to the Hanzelijn. About 15% less trips are made via this line. It is plausible that this decrease is caused by a shift of travelers from the Kampen station to Kampen Zuid station. These stations are only a few kilometers apart. Travelers at Kampen Zuid indicated for 56% that they would make the trip from Kampen station when the new station would not have been build. From Kampen Zuid more destinations are reached directly without transfers or faster than from Kampen station.

Due to the shift of trips to the Hanzelijn, also a strong increase in trips is visible on the Flevolijn (index 1.69 compared to the situation before opening the Hanzelijn). The Flevolijn operates in line with the Hanzelijn so travelers from the North traveling via the Hanzelijn to the Randstad will also pass the Flevolijn.

In line with the change in route choices, the OD-trips which were forecasted to be made via the Hanzelijn, were often mentioned in the surveys: Zwolle, Groningen and Leeuwarden on the one hand, and Amsterdam Central, Amsterdam South, The Hague Central and Schiphol on the other hand. These are all OD-relations which can be reached via the Hanzelijn without transfers.

As expected, about half of the travelers on the Hanzelijn (50.3%) indicated that before they also traveled by train, but via another route. 46.4% traveled before via Amersfoort/Utrecht, while 3.9% traveled from or to another station around the Hanzelijn. 86.2% of these travelers assigned their rerouting to the better train connection with the opening of the Hanzelijn: faster, less transfers, and/or station better attainable.

In addition to the passengers that change their route, 5.9% of the Hanzelijn-passengers indicated that they traveled before for the same purpose by train but to another destination (Figure 9). 75.1% of this group travelled for social-recreational purposes, which matches the idea that, for example, travelers go shopping in Zwolle instead of Almere from Lelystad. Only half (49.9%) of these travelers indicate that they changed their destination because of the Hanzelijn. The other half traveled via the Hanzelijn for no particular reason (28.2%), because of a change in destination address (8.0%) or because of works on the tracks elsewhere (4.5%).

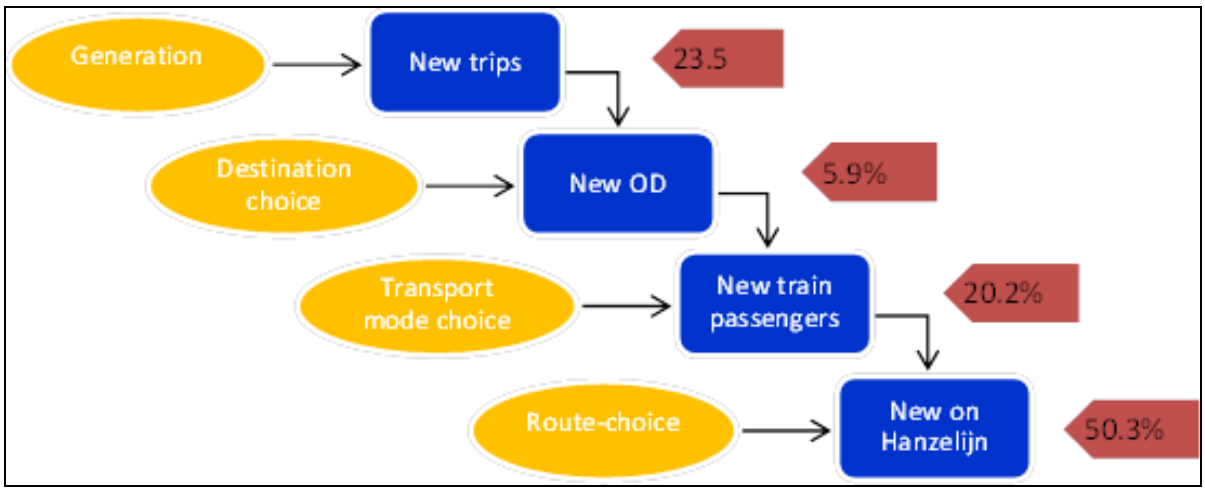

Figure 9. Choice behaviour of Hanzelijn passengers: change in travel pattern

4.2 New train passengers

56.2% of the passengers on the Hanzelijn traveled by train before, the other 43.8% is new as a customer in the train. They made the trip before by another mode (20.2%), or did not make the trip before at all (23.5%), see Figure 9.

Of all passengers, 11.4% took the bus, 8.7% the car or motor, and 0.2% the bicycle for the same trip before the Hanzelijn went into operation. The large number of passengers changing from bus to train is notable. These passengers travel mostly in between stations on the Hanzelijn (79.6%) and many of them say that they changed mode of transportation because the other mode is no longer available. Some competing bus services around the Hanzelijn-track were cancelled when the Hanzelijn opened. Despite these forced changes, 69.6% of these passengers travelled via the Hanzelijn because of the faster connections, less transfers, and/or better attainable stations.

Of the passengers on the Hanzelijn that did not make the trip before by another mode or route, 49.2% indicated to travel there because of the Hanzelijn. 40.1% declared that they had no particular reason to travel via the Hanzelijn. This suggests that about half of the new passengers can be assigned to the new rail-infrastructure.

4.3 Trip-generation

In addition to the new train passengers generated by the Hanzelijn, passengers make more trips by train because of the opening of the Hanzelijn. On Tuesday, about one-third on the passengers indicate that they will travel more by train because of the Hanzelijn. More than half of this group even states that they will travel multiple days a week extra. On Saturday less extra trips are made. This corresponds to the large share of frequently travelling commuters (23.7%) and students (25.0%) on workdays and the less frequently traveling social-recreational passengers in the weekend with travel purposes such as holidays/leisure trips (28.1%) and visiting friends and family (38.4%). Accordingly, frequency is lower in weekends, but per trip more travelers' kilometers are made.

In total, 30.2% of the travelers on the Hanzelijn indicated to make more trips because of the Hanzelijn, 33% on Tuesday and 28% on Saturday. This percentage is higher in Sprinters (47.0%) than in Intercitys (25.2%). This difference is explained by the opening of new stations that are only served with Sprinters and the high number of passengers who reroute over longer distances (Intercity).

Even while passengers who made the same trip via another route before are not new in the train, they make about 18.7 trips per year extra on top of the 120.4 trips they already made. Being a large group of passengers on the Hanzelijn (50.3%), these passengers are accountable for 21.7% of all new trips. Additionally, passengers who changed their destination are accountable for 1.8% of the new trips, with about 13.2 extra trips per year.

Most new trips (64.7%) are made by passengers who traveled by another mode before. These travelers make about 138.8 trips per year extra on top of the 64.7 trips per year they already made. This increase is enormous and important in the change of modal split. Passengers who did not make the same trip before, travel least per year (76.9 trips plus 21.8 extra trips per year), but generate 11.8% of all new trips.

4.4 Number of passengers in trains

As a result of the shifted route-choices, new train passengers and trip generation, quite some travelers travel via the Hanzelijn after opening in December 2012. The forecast made in May 2012 gave a concentration of more than 16,000 trips on an average workday in 2013.

The counting performed on Tuesday in April 2013 per section indicated a minimum concentration of 13,000 trips on the Hanzelijn (a precise number cannot be given due to the method of counting). Counts of ticket inspectors indicate that these concentrations are comparable to other Tuesdays on the Hanzelijn. Thus, in April realized numbers were lower than the forecasted numbers. However, expected is that the forecasted number will be met because of an assimilation period. In the first few years after opening new rail-infrastructure, an increase in number of trips is visible. Travelers have to adjust to the new situation and due to habitual behavior this can take some time. In addition, the

second half of 2013 will give more trips because the months October and November are by far the busiest months of the year.

On Saturday more trips are made via the Hanzelijn than on a workday. More than 15,000 trips were made on the counted Saturday. No forecast was given for the weekend, but expected was that a large number of people would travel on the Hanzelijn to the Randstad, especially Amsterdam, for social-recreative purposes. Accordingly, Intercitys had higher concentrations of passengers than Sprinters; the Intercity-concentrations outreached the workday forecast. During the day of counting, workings on the rail-section in the east (between Apeldoorn- Amersfoort) and the reopening of the Rijksmuseum could have had an effect on the number of trips on the Hanzelijn. However, no large increases were expected because of these events. Counts from ticket inspectors indicate that the concentration of passengers on the Hanzelijn differs quite a lot on Saturdays, but the Saturday that was counted did not differ much from the average Saturday, see Figure 10.

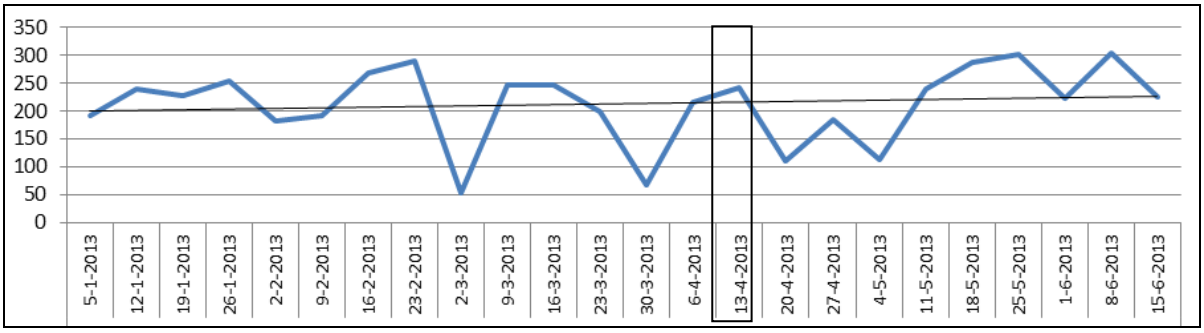

Figure 10. Average number of trips per Intercity per Saturday in 2013 (source: counts of ticket inspectors)

In more detail, the counts show that most travelers travel in the morning to the Randstad and back in the late afternoon, see Figure 10. Especially in the Intercitys the peak in the morning towards the Randstad and the peak in the afternoon back to North are most visible. This indicates that, as expected, the Hanzelijn is most used for the direct connection to the Randstad.

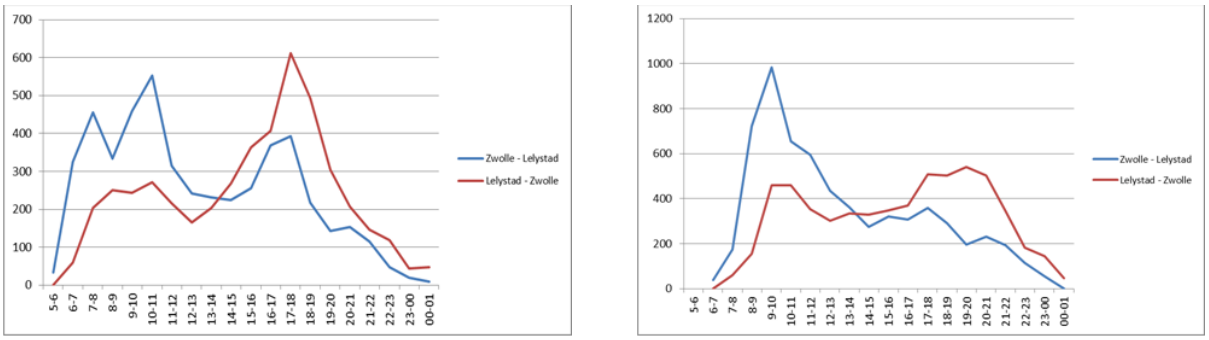

Figure 11. Number of Hanzelijn Intercity passengers over time and per direction on Tuesday and Saturday (source: NS)

On Saturday the peaks in the Sprinters resemble the Intercity-peaks without much difference between the different sections (Table 1). This indicates that more passengers are traveling by Sprinter from Zwolle to Lelystad and further than on Tuesday. On

Tuesday, Sprinter passengers mostly travel in the morning peak from Kampen Zuid to Zwolle, and in lesser extent from Dronten to Zwolle or Lelystad. The Sprinters are busier towards Zwolle than towards Lelystad (Table 1), while the forecast suggested both directions would be traveled equally. Additionally, the number of trips between Kampen Zuid and Zwolle was forecasted higher. In contrast, numbers of trips around Dronten are already close to the forecasted numbers, indicating that these numbers may outreach the forecast in the end of 2013.

Table 1: Number of trips per workday per section (source: NS)

	Tuesday 16 april 2013	Forecast workday 2013	Saturday 13 april 2013
IC Zwolle → Lelystad	4,893	5,897	6,305
IC Lelystad → Zwolle	4,625	5,509	5,946
SP Zwolle → Kampen Zuid	1,644	2,708	1,348
SP Kampen Zuid → Dronten	1,600	1,901	1,306
SP Dronten → Lelystad	1,432	1,811	1,351
SP Lelystad → Dronten	1,764	1,867	1,562
SP Dronten → Kampen Zuid	1,941	1,936	1,567
SP Kampen Zuid → Zwolle	2,085	2,628	1,504

4.5 Number of passengers at new stations

The number of boarding and alighting passengers at the new stations Kampen Zuid and Dronten were forecasted multiple times. The newest forecast, made in May 2012, estimated Dronten at 2,355 and Kampen Zuid at 4,222 passengers on an average workday in 2013, see **Fout! Verwijzingsbron niet gevonden.**

Kampen Zuid drastically falls behind the forecast and this forecast will also not be met by further assimilation growth over time (**Fout! Verwijzingsbron niet gevonden.**). This lagging is the result of a housing area next to the station which is not realized and the focus of bus services on the old Kampen station. Additionally, it was assumed in the forecast that the train connection from Kampen station would be transferred into a tramline. Survey results underpin these differences. 6.3% of the travelers at Kampen Zuid indicate that they arrive by bus, while at Kampen station 24% of the travelers arrive by bus. Only 33% of the travelers at Kampen Zuid did not travel by train before; 56.5% of the travelers indicate that they would travel from Kampen station if the new station was not build.

In contrast, Dronten performs above expectations: the counted number of travelers is similar to the forecasted number, while further growth during the year can be expected. It is assumed that this performance can be assigned to the change in bus services. With the opening of the

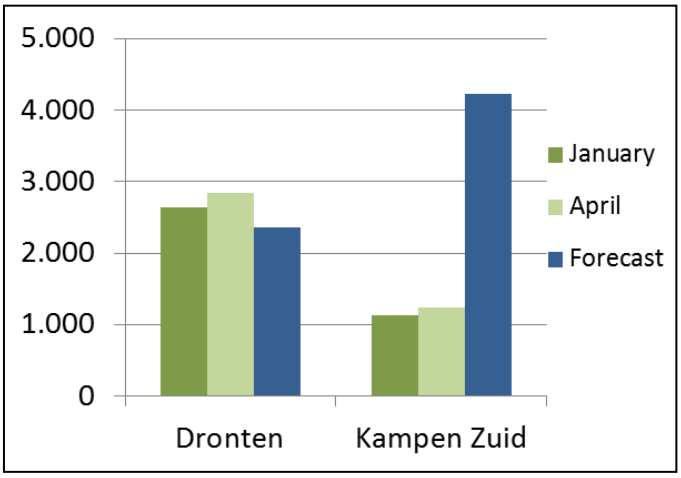

Figure 12. Forecast and realization of numbers of boarding and alighting travelers at the new stations (6.00h-22.00h)

Hanzelijn the intercity bus line was cancelled and new bus lines towards the new station were established. In accordance, many passengers at Dronten arrive by bus (26.1% with respect to 9% at comparable stations), and 45.2% indicated that they traveled by bus before. Due to the changes in bus services, and because no other train station is nearby Dronten, Dronten attracts many new train passengers (77.5%).

5. Conclusion

The Hanzelijn decreases travel time from the northeast of the Netherlands to the Randstad by 7 minutes. In addition, more direct connections are established between the northeast and the Randstad and two new stations are opened in the Flevopolder. In total, 79.0% of the travelers on the Hanzelijn indicate that they travel there because of the opening of the line: the origin station is more attainable, the route to their destination is faster, and/or fewer transfers have to be made.

Due to the Hanzelijn, many travelers change their routes or transport mode. As expected, transport on the Veluwelijn and Gooilijn is decreased; about one-third of the passengers traveling before on the Veluwelijn are now traveling via the Hanzelijn. The number of passengers on the Hanzelijn corresponds to the forecast: with further growth in the second half of 2013 the forecast will be met. However, Kampen Zuid will not meet the forecast because environmental factors did not turn out as expected. In contrast, Dronten performs better than expected, mainly because of the cancelled competitive bus service.

As expected, the Hanzelijn is used most for trips towards the Randstad: away in the morning and back in the afternoon. In the weekends, passengers mainly travel via the Hanzelijn for social-recreational purposes, such as city trips to Amsterdam. Remarkable is that more trips via the Hanzelijn are made on Saturday than on Tuesday.

Almost half of all Hanzelijn-passengers is new in the train. About half of this group changed mode, whereby modal split of the train has grown in respect to the car. The other half of the new passengers is also new on the route.

About one-third of all Hanzelijn-passengers indicates to make more trips per year due to the opening of the Hanzelijn, with more extra trips made on a workday than on Saturday. Especially travelers traveling before by bus or car make many extra trips per year.

In total it can be concluded that the Hanzelijn did meet expectations and improved the product of the Dutch railways. More trips are made and new customers are drawn with the faster and more frequent offer.