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Rotterdam The Hague Airport: an analysis of the application of automated vehicles at Rotterdam the Hague Airport as part of the tender ‘Marketplace for Infrastructure’

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Abstract

This paper reports about the case study at Rotterdam the Hague Airport in regards to the tender “Marketplace for infrastructure”. This tender was put on the market by the ‘Verkeersonderneming’. One of the challenges of the tender was deployment of an automated vehicle between Rotterdam The Hague Airport and metro station Meijersplein. Even though there were interested parties, no party subscribed. This paper gives insight in why the parties did not subscribe and under what circumstances they would.

Keywords: Automated Vehicles, Public Transport, Tender

1. Introduction

In 2016 the ‘Verkeersonderneming’ started the tender "Marketplace for Infrastructure". The Verkeersonderneming is a public-private partnership between the municipality of Rotterdam, the Metropolitan region Rotterdam The Hague (MRDH), the Ministry of Infrastructure and Water Management / Rijkswaterstaat and the Port of Rotterdam. This collaboration aims at addressing accessibility issues, strengthening and optimizing the infrastructure and reducing traffic jams, developing and implementing innovative solutions, contributing to sustainable behavioral changes and the collaboration between public-public, public-private, private-private parties and improving public-private-people relations [1].

The Marketplace for Infrastructure was a new way of tendering where the market was asked to solve infrastructural challenges in the Rotterdam region. In the Netherlands it is customary to tender a certain solution, but in this tender market parties were free to come up with a solution themselves. The tender started with a market exploration which attracted lots of parties. The Verkeersonderneming defined six challenges in the Rotterdam – The Hague region. The parties were asked to write a two-pager about their

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proposed solution. Ten of these two-pagers have been selected to write an essay. There was no further (legal) commitment in this exploration phase.

One of the six challenges in the tender was the connection between Rotterdam The Hague Airport (hereafter RTHA) and metro station Meijersplein. The Verkeersonderneming asked to provide a solution involving alternative (automated) vehicles instead of the regular public bus. The route from the metro station to RTHA seems promising for alternative (automated) vehicles [2]. Even though there were interested parties, no party has registered for this challenge.

1.1 Research questions

The goal of this evaluation is to find out why interested parties did not subscribe for the tender and under what circumstances they would. This information is important for the Verkeersonderneming to determine whether such way of tendering can be used more often. The lessons learned from this procedure can contribute to improve the procedure and to provide input for a possible re-tender. The following research questions have been answered:

1. Why did the interested parties not subscribe for the tender?
2. Under what circumstances would they have signed up for the tender?

To answer these questions, a document study was conducted. All existing material from the exploration phase and tender phase have been studied. Also, the two-pagers and essays have been studied. All involved parties (including interested parties) have been interviewed. Three parties expressed their interest for the RTHA challenge. These parties have been interviewed and their answers are included in the report.

2. The RTHA area

2.1 Travellers

RTHA is mainly used by travellers for holiday or business purpose. Since the airport is close to The Hague, where the Dutch government is situated, members of the government and their guests make use of the airport as well. The airport is a growing airport and has currently 40 destinations. One of the objectives of RTHA is to expand the amount of destinations [3].

The airport has 2.500 job positions [4]. The employees and the passengers are the main traffic flow to and from the airport. Currently RTHA can be reached by public transport using bus or metro and bus. Passengers arriving at Rotterdam Central station can travel by bus 33 to RTHA. Another and faster option is travelling from Rotterdam Central station by metro to Meijersplein. At metro station Meijersplein passengers have to change to bus 33 to RTHA. Bus 33 travels between Rotterdam Central station (starting point) and metro station Meijersplein (final destination) via RTHA. The bus departs every ten minutes on weekdays. In the evening and during the weekends the bus departs every fifteen minutes. The first bus departs at 5.45 AM and the last bus departs at 00.16 AM [5].

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The "Milieueffectenrapport" (Environmental Impact Report) of 2015, carried out on behalf of RTHA, shows that approximately 13% of travellers with the airport as their destination, travel to and from the airport by using public transport [6]. Another research into the traffic flows around the airport, carried out in 2016, indicates that 12% of all travellers with the airport as destination travel by public transport. This research also reports the percentage of travellers travelling to other airports in the Netherlands using public transport. 30% of all passengers travelling to Schiphol Airport use the train and 14% use the bus or a taxi service. 28% of all passengers travelling to Eindhoven Airport use public transport to travel to the airport [7]. In comparison with these airports, RTHA has a relatively low percentage of passengers using public transport. In an exploratory study on the public transport accessibility of RTHA, carried out by the Rebel Group, it is assumed that 10% of the airport employees use public transport to travel to and from the airport. This percentage is lower than the percentage of passengers travelling to the airport, presumably because the shifts of the employees start or end at times when no public transport is available [8].

Data from the current public transport company, the RET, shows that on average 610 travelers use the Rotterdam Central - RTHA - Meijersplein bus service on a daily basis. 145 of these travelers use the bus to get from metro station Meijersplein to RTHA. The capacity of this connection is not being used fully. The maximum capacity for RTHA - Meijersplein is 654 travelers and for RTHA - Rotterdam Central 514 travelers. The demand for transport on the route of bus 33 has large fluctuations (during the day and during the year). Sometimes there are no passengers and sometimes 100 passengers at once. This is due to the arrival and departure of airplanes.

2.2 Infrastructure

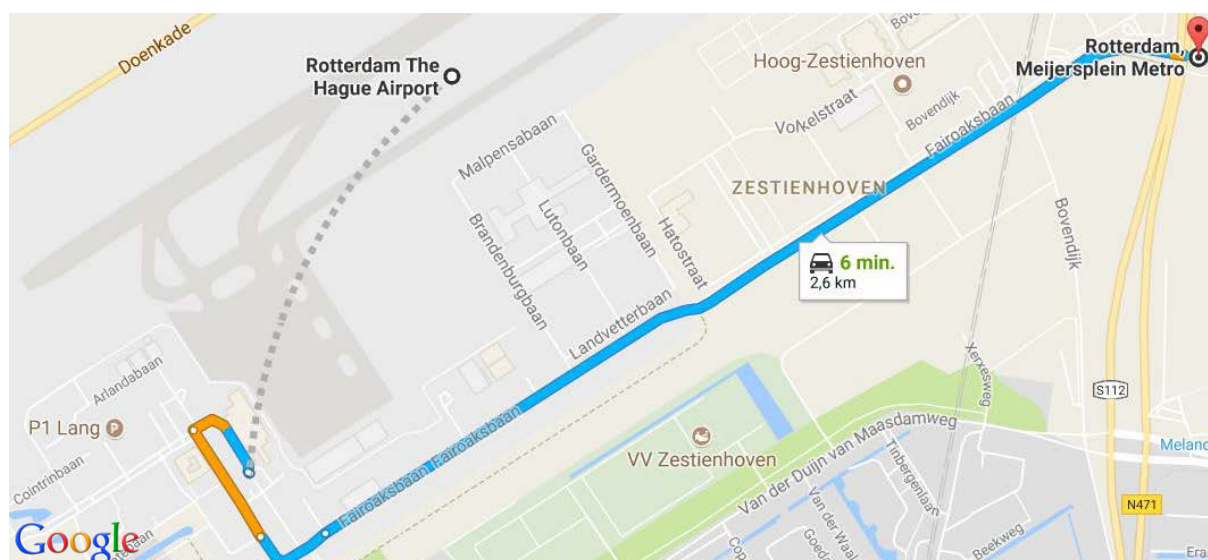


Figure 1 – Route from metro station Meijersplein to RTHA [9]

The route of bus 33 between metro station Meijersplein and RTHA is shown in the figure above and is 2.6 kilometers. On average, it takes six minutes to get from the metro station to the airport. The route

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contains two stops; the Gilze-Rijenstraat bus stop and the Lutonbaan bus stop [10]. The road layout is the following:



Figure 2 – Road lay-out Fairoaksbaan [9]

On the image above (figure 2) it shows that the lanes are separated from each other. This means there is no ongoing traffic. The two-way bicycle path with adjoining footpath is separated from the main roadway. However, the route does have a number of ground level crossings (figure 3).



Figure 3 – Ground level crossings [9]

These ground level crossings can be challenging for an automated vehicle. Traffic on the Fairoaksbaan has priority, which means the vehicle does not have to give way to crossing traffic. However, the vehicle needs to be able to detect other traffic and anticipate accordingly. Regulating crossing traffic with, for example, traffic lights can decrease the potential risks of collisions and can help optimize the flow of the vehicle.

3. The tender

3.1 Market survey

A market survey has taken place prior to the tender. This market survey was called "De

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Rotterdamse Infrastructuur Uitdaging” (in English: The Rotterdam Infrastructure Challenge). Collaboration with market parties is considered to be necessary to implement innovations effectively. The Netherlands has the ambition to be a frontrunner with regards to projects with automated transport [11].

Prior to the market survey, it was not clear to the Verkeersonderneming what kind of budget would be appropriate for such an assignment. It was also unknown whether there would be interest from the market. Within the market survey, parties have been asked to come up with solutions for infrastructural bottlenecks in the Rotterdam region. Also, the parties have been asked to clarify how and to what extent these bottlenecks could be resolved. In addition, the parties have been asked to indicate if there are possibilities to expand (for example scaling up to multiple locations). Parties have been requested to keep the “Beter Benutten Vervolg^{*}” program in mind while drafting the solutions. Finally the parties have been asked to indicate how the proposed solution can be realized.

The market survey started with a so-called ‘two-pager’. The parties have been requested to describe in two pages what solution they have for which bottleneck in the Rotterdam region. Also, they have been asked to give insight in the business case and what investment they are willing to make. Last but not least, the parties have been asked to describe who would fulfill which role during the construction and during deployment. An independent jury choose ten two-pager proposals and asked the parties to elaborate their two-pager in an essay. Four out of ten essays were about the RTHA challenge. The parties received a fee for this essay.

After the essay phase, the market survey was completed and a tendering strategy was established. The Verkeersonderneming choose a public European tender for six infrastructural challenges in the Rotterdam region. One of these challenges was, as mentioned, the connection between RTHA and metro station Meijersplein.

3.2 Tender requirements

To be able to register for the tender, the requirements as set by The Verkeersonderneming must be met. Hereby the requirements as set by the Verkeersonderneming[†]:

General requirements applicable to all registrations:

1. The offer must be a solution that contributes to the accessibility objectives of the ‘Beter Benutten Vervolg’ (‘Optimizing Use sequel’) program.

* In the ‘Beter Benutten’ (‘Optimising Use’) programme, the Dutch government, regions and businesses are working together to improve road, waterway and railway accessibility in the busiest regions. [12]

† Limited to the requirements relevant to the RTHA challenge

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2. 50% of the investment for realization must be private (knock out).
3. The operation of the offer must be 100% private (knock out).
4. The offer must contain a financially and commercially viable business case (knock out).
5. The (physical) realization of the project must start before January 1st 2018.

Challenge specific requirements, where applicable:

1. The physical last-mile solution is accessible and easy to use for all types of travelers and preferably scalable to other locations.
2. If the offer is legally regarded as public transport, the tenderer must elaborate the effect of the offer on the current concession.
3. Passengers need to be able to use their OV-chipcard when the vehicle is open for general use of the public.
4. The offer must take into account fluctuating traveler numbers due to arrivals and departures of airplane passengers, waiting times at peak hours and working hours of employees.
5. A backup is required in case the facility is not operating (even if it is temporarily).
6. If it is connected to a local station it is preferable that the 'airport experience' starts at the station.

Challenge specific preconditions, if applicable:

1. All vehicles and stops must meet the basic requirements of accessibility.
2. The solution should preferably be linked to the Roadmap Next Economy of the MRDH [13].

4. Interviews

The parties who have expressed their interest for the RTHA challenge are:

- 2getthere;
- APPM (consortium coordinator);
- RET (Rotterdamse Elektrische Tram).

None of these parties have subscribed for the tender. In the interviews they were asked why they didn't subscribe and under what circumstances they would subscribe. In addition the parties were asked how they experienced the new tendering method. Also, during the evaluation there was contact with RTHA.

4.1 2getthere

2getthere is a company that supplies automatic transport systems and is based in Utrecht, the Netherlands. 2getthere has considerable experience with the deployment of an automated shuttle bus near metro station Kralingse Zoom in Rotterdam, the Netherlands. In the 1990s, 2getthere participated in connecting the Rivium Businesspark to the metro station Kralingse Zoom with an automated shuttle. Currently the second generation of vehicles supplied by 2getthere are in operation. They have been in operation since 2005. The 2getthere vehicles operate on a semi-designated lane with a few intersections. These intersections are equipped

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with barriers to keep the crossing surfaces clear of other traffic. The supervisor system determines the route of the vehicles and the vehicles drive these routes autonomous. The vehicle can, among other things, determine his position based on magnets in the road surface. This so-called 'proven technology' has been used internationally by 2getthere.

With regards to setting up an transportation system between metro station Meijersplein and RTHA, 2getthere considers their system suitable. To realize a system such as the Rivium Parkshuttle, infrastructural changes are necessary. Also, bus stops are needed and intersections need to be regulated. By buying the vehicles, the software is included. This means that the costs of the vehicles are higher than the costs of a regular bus. 50% of the investment will be covered by the Verkeersonderneming. This means that the other 50% has to be earned back in the operation. 2getthere saw no possibilities of earning back the investment within the duration of the concession[‡] of 15 years [14].

4.2 APPM – Engie – Nissan – Connexion

Consultancy company APPM, technical service provider Engie, car manufacturer Nissan and public transport company Connexion formed a consortium to fulfill the assignment. Together they came up with a plan to not just implement an electric automated vehicle, but to combine more innovative ideas with regards to energy generation, storage and consumption. By combining these concepts a positive businesscase was possible. Also, by setting up a crowdfund they could collect more money to cover the 50% investment of the project. Even though this consortium came up with a positive business, they did not subscribe. Since all their ideas are very innovative, they are also risky. It was the consortium not clear who would have to deal with, and pay, when the plan fails or when unforeseen extra funding is necessary. More time was needed to research the different aspects of the plan and evaluate the risks. Also, many stakeholders are involved because of the innovative concepts and scope of the plan. The consortium needed more time to get all stakeholders on board and to come to an agreement with all the stakeholders [15].

4.3 RET

Public transport company RET is the current concessionaire of the Rotterdam region. The current bus from RTHA to metro station Meijersplein is being deployed by RET. RET always tries to achieve the best possible connection. At RTHA this is difficult due to the peaks and troughs in the transport demand. The current use of buses provides an overcapacity with respect to use. In theory, the use of automated transport seems to be viable. The high

[‡] In the Netherlands transport concessions are needed to transport passengers. In this case the Metropolitan region Rotterdam-The Hague determines via public tendering who will fulfill the concession. The company with the concession has the sole right to provide public transport in a specific region [16]

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investment is compensated by the low operational costs and savings on the driver. However, in practice a steward needs to be present in the vehicle. RET soon came to the conclusion that an operation on this route without subsidy is not possible. The investment for the vehicles and the system cannot be recovered within the concession with the current passenger numbers. Even though a business case is not possible at RTHA, RET is open to new or other innovative forms of transport to provide an optimal connection, but also to coordinate supply and demand [17].

5. Results

5.1 Why did the interested parties not subscribe for the tender?

In the end, none of the parties registered for the challenge. Interested parties had various reasons not to subscribe. The following reasons were decisive for the parties:

- Viable business case was not possible within current requirements;
- Many risks are involved in 'cutting-edge' innovations and there was a lack of clarity on who would bear these risks;
- The time span to submit an offer was too short and realization starting before January 1st was not possible;
- 100% private operation was not possible;
- The lack of clarity on collaboration with the currently operating public transport company and the possible breach of the current concession caused restraint.

5.2 Under what circumstances would they sign up for the tender?

The interested parties were in general very positive about this new way of approaching the market with a challenge instead of a solution. The parties also stated that they would be interested again if the Verkeersonderneming started a new tender for RTHA. Although some requirements were too difficult to work with. For some parties the 50% private investment requirement was too strict. Also the requirement of a 100% private operation of the system was very difficult for all parties. Normally, in the Netherlands, the public transport company receives government funding to fill the gap of the business case. This is part of the arrangements made in the concession. With this tender no public money was available to fill the gap of the business case. All parties had difficulties with this requirement.

With cutting-edge innovations come new risks. Beforehand there was no mention of who was going to bear these risks. More clarity on these risks could have been given before or during the tender. Also, clarity about the current concession and collaboration with the current public transport company is needed.

6. Conclusion

This paper reported about the analyses in regards to the tender "Marketplace for infrastructure". One of

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the challenges of the tender was deployment of an automated vehicle between RTHA and metro station Meijersplein. Even though there were interested parties, no party subscribed.

Interested parties had various reasons not to subscribe. The business case and private operation were challenging, but the time span has put a lot of pressure on the tender, causing the parties not to subscribe. The lack of clarity on collaboration with the current operating public transport company and the possible breach of the current concession caused restraint. The parties would be interested again if the Verkeersonderneming started a new tender for RTHA, but some requirements need to change. Such as the 50% investment, private operation and risk management. The parties were in general positive about the new way of approaching the market, but more time is needed to reach agreements with the Verkeersonderneming and other parties involved.

Currently the public bus is still in operation between metro station Meijersplein and RTHA. The Verkeersonderneming and RTHA are still interested in operating an automated vehicle and are looking into other possibilities.

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