

Report market consultation

Project replacement line displays Combino trams

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1 Context, company and / or project objectives

1.1 Background marketconsultation

GVB provides public transport and ferry services in and around Amsterdam. The tasks of the organization also include the management and maintenance of the (rolling and sailing) stock, the management and maintenance of the rail infrastructure and the maintenance of social safety in and around public transport.

In the past period, GVB has succeeded in putting the traveler first and wants to continue developing from a public transport company into a partner for the city of Amsterdam in the coming years. GVB implements this by pursuing the following strategic objectives:

1. GVB is according to its travelers the best urban transporter in the Netherlands;
2. Facilitate a growth in the number of travelers to 1 million trips per working day;
3. To strive for a decrease in subsidy dependence in the operation of public transport;
4. Be among the five best employers in Amsterdam;
5. Being a strong partner for Amsterdam and Amsterdammers.

One of GVB's sub-tasks is to manage and maintain the rail stock with which it carries out its operations.

1.2 Background project

The Combino tram fleet is halfway through its technical lifespan and a number of parts have been added to these vehicles in recent years.

The Combino trams were delivered by Siemens to GVB in the years 2003 and 2004 with the off-line displays in use today. The trams are referred to as 13G and 14G, which are one-way (single-head) and two-way (double-head) vehicles, respectively.

Line displays are the displays that are visible from the outside of the tram (figures 1.1 to 1.4). The functions of the line displays concern the indication of the line number and the final destination.



Figuur 1.1: Frontdisplay [aand. 3]



Figuur 1.2: Backdisplay [aand. 5]



Figure 1.3: Line number side display [aand. 7]



Figure 1.4: Line and destination display [aand. 9]

Due to the increasing repair costs for the displays, the GVB has decided to renew the displays of these trams once for use during the rest of the lifespan of these trams, namely the next 12 to 15 years.

1.3 Purpose Market consultation and intended result

The objectives of the market consultation were:

- Informing the market about the objective of GVB's tendering process in the field of replacement of line displays;
- Testing the set of draft specifications for replacement of line displays;
- Testing various options to market the delivery / assembly as a whole or in different work packages;
- Testing the possibilities with regard to technical lifespan, delivery times for parts and warranty periods;
- Testing possible interest in this assignment with potential suppliers.

The relevant input from the market consultation will be used by GVB in the design of the European tender for Procurement and replacement of line displays for Combino trams.

With the help of the information obtained during the market consultation, GVB is able to make conscious choices internally in the further elaboration of the tender document and to better align the document with the possibilities and developments in the market. The choices to be made include:

- Choosing the correct division of the assignment into 1 or more work packages;
- Setting up the correct form of contract;
- Choosing the right delivery and contract conditions with regard to back-delivery and warranty periods;
- Choosing the right selection criteria and award criteria to select suitable suppliers and to make correct use of suppliers' distinctiveness.

1.4 Organization of market consultation

Leo Snel (senior purchaser GVB) organized and carried out a market consultation for substantive support in setting up and conducting a market consultation into the possibilities that the market offers to realize the ambition of MeT / GVB. The implementation was carried out in close

collaboration with Leon Schrage (GVB rail equipment project manager), Wesley Teeuw (tram maintenance engineer), Hugo Molenaar (ICT vehicle manager) and Chris Elsinga (maintenance engineer). Head of Rail Material, Ricardo van Snek, acted as client. The market consultation was conducted between November 17, 2020 and January 20, 2021.

2 Accountability and method of working Market consultation

The approach to the organization of the market consultation consisted of the following components:

2.1 Determining the provisional scope and structure of the purchasing process

The following provisional scope, procurement and project objectives are included in the market consultation document:

Each tram has a line display at four locations, namely on the front, rear and both sides. These four line displays are each different from each other. All four line displays of all 155 trams need to be replaced and spare parts will also be purchased.

The supplying party must be able to provide guarantees regarding the lifespan of the line displays and the minimum period during which the GVB can carry out repairs or have repairs carried out and during which the same line displays can still be purchased new.

In general terms, the new line displays should:

- be LED displays;
- To be able to communicate over Ethernet with the Generic ICT Vehicle Architecture (GIVA) information system of the GVB; The GIVA will control the line displays;
- to function reliably while driving the trams;
- be safe for passengers, bystanders and personnel during maintenance and use;
- are pleasant and healthy to work on and with;
- contribute to a positive experience of the traveller's journey.

The GVB wants to find a party that supplies the new line displays, makes them suitable and also installs and adjusts them. A partner is therefore being sought who can carry out this complete replacement process as a project.

Working delivery of all new line displays is required by the end of the year 2022.

The following quantities were requested for the 13G vehicles:

- | | |
|---|-------------|
| • Frontdisplay [aand. 3]: | 151 pieces; |
| • Backdisplay [aand. 5]: | 151 pieces; |
| • Line- and destinationdisplay [aand. 9]: | 151 pieces; |
| • Line number side display [aand. 7]: | 151 pieces. |

The following quantities were requested for the 14G vehicles:

- | | |
|---|-----------|
| • Frontdisplay [aand. 3]: | 8 pieces; |
| • Backdisplay [aand. 5]: | none; |
| • Line- and destinationdisplay [aand. 9]: | 8 pieces; |
| • Line number side display [aand. 7]: | none.. |

Reservevoorraad:

- | | |
|---|-----------|
| • Frontdisplay [aand. 3]: | 5 pieces; |
| • Backdisplay [aand. 5]: | 5 pieces; |
| • Line- and destinationdisplay [aand. 9]: | 5 pieces; |
| • Lijnnummer zijdisplay [aand. 7]: | 5 pieces. |

In line with this scope, the following purchasing and project objectives have been included in the market consultation:

2.2 Determining the questions of the market consultation

The question of the market consultation is divided into the following four parts with the associated questions:

1. Testing the set of draft specifications for replacement line displays. The objective is to present to market parties whether these specifications are complete enough to issue a quotation and to ask whether there are proposals for improvements, additions and optimisations;
 2. Testing the interest of market parties in various options to market the delivery / assembly as a whole or in different work packages;
 3. Testing the possibilities with regard to technical lifespan, post-delivery terms for parts and warranty terms to be used for components to be used in this order;
 4. Testing interest in participating in the tender for this contract with potential suppliers
- vraagstelling van de marktconsultatie is onderverdeeld in de volgende vier onderdelen met de daarbij behorende vragen:

2.3 Determining criteria and selection of suppliers

The market consultation was open to all potential suppliers. Suppliers were free to register and to participate in the market consultation.

2.4 Substantive and process preparation of the market consultation

A market consultation document has been drawn up for the substantive preparation of the market consultation (see Appendix 1). This sets out the question. The document also contained further information about the scope of the proposed tender, the objectives of this project and a description of the procedure and the rules of the consultation.

In addition, the market consultation document includes a schedule describing the practical implementation of the consultation. This concerned the deadlines, the days on which interviews would be held, those present, the reporting and reporting. The market consultation document indicated how the applicable tendering rules will be complied with when organizing the consultation.

A total of seven suppliers have registered to participate in the market consultation. These suppliers have registered via TenderNed on the basis of the registration form included in the market consultation document. All seven were subsequently provided with the specifications and completed and submitted the questionnaire digitally. These seven parties then took part in the round of talks. The participating parties are a good reflection of companies active in the supply and / or production of components (5 parties) and companies that work as system integrators (2 parties).

2.5 Response from the market Questionnaires submitted

After registration, 7 suppliers completed and submitted the questionnaire.

2.6 Conducting discussions with market parties

On January 13 and 19, 2021, a total of seven (MS Teams) meetings took place with market parties. The interviews were structured on the basis of the questionnaire (see Appendix 1), which also formed the structure for reporting.

2.7 Reporting, analysis, internal and external reporting

Reports have been made of the questionnaires and interviews. Based on the reports, an analysis was made and conclusions were drawn about the significance for the tender to be organized. This analysis and conclusions are contained in this final report intended for the GVB project team that is preparing the tender for the replacement of line displays for Combino trams.

An anonymous report has also been made of the market consultation that is suitable for sharing with the market parties that participated in the consultation. The anonymous report will be published on TenderNed and provided to parties that participated and also added as an appendix to the European tender documents, so that all interested market parties have the same information. This guarantees a level playing field between market parties.

3 Market consultation results

3.1 Questions about the draft PoR

A draft schedule of requirements has been drawn up for the tender to be carried out. This PoR contains the technical elaboration and the requirements that the LED displays to be supplied must meet, the requirements regarding ICT integration and the requirements surrounding the installation process as GVB intends to use. The participants were asked to comment on and submit proposals for improvement for the draft Schedule of Requirements.

With regard to the (draft) specifications, MeT and GVB asked the participants a number of questions:

Are the components to be applied as described in the draft program of requirements (Appendix 3) so-called "off the shelf" products or can they be replaced by "off the shelf" products?

The participants give three answers here:

- Yes it concerns off the shelf products (1 participant)
- No, it is a custom product that is specially made for this project (4 participants)
- No, it is a standard product that is subsequently adapted to size for this project (4 participants)

Is the draft schedule of requirements (appendix 3) sufficiently clear to you to put together a configuration of components to be supplied by you, which, after installation (by you or a third party engaged by you), can be commissioned and tested with positive results ?

The participants give two answers here and a number of suggestions:

- Yes the specifications are clear enough (5 participants)
Note: Give participants in the tender ample opportunity to properly absorb the Combino tram and to measure things on the spot in the tram, to open shutters, etc. (2 participants)
- No, data is still missing to determine a good configuration (2 participants)

Preferably provide the PoR during the tender in English;

Missing data include:

Exact drawings with correct dimensions for, among other things, brackets;

Location of connectors;

Is the concept program of requirements sufficiently clear to you to be able to properly specify all pre-specified typical configurations?

- Yes (3 participants)
- Yes, but we would still like to ask questions for clarification after being included in the vehicle (2 participants)
- No, data is still missing to determine a good configuration (2 participants)

Missing data include:

Location of connectors;

Dimensions of the current displays;

Make it clear whether the displays should be labeled ITxPT;

Add a clear overview of the requested symbols to be displayed on the front screen in the PoR;

Provide English-language documents

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A number of specific technical implementation requirements have been included in the draft schedule of requirements (Appendix 3). Do you expect these conditions to be fulfilled by you?

- Yes (5 participants)
- No (2 participants)

We do not have enough information at this stage to indicate this

In order to be able to assess this, we would like to receive all documents in English.

Are you prepared, even if repairs and reinstallation of the screens and associated cabling and software are carried out by GVB in-house, to guarantee the proper functioning of the configuration, whereby commissioning and testing are carried out in accordance with instructions issued by you?

- Yes (3 participants)
- Yes but under the following conditions (3 participants)

Yes, this is only possible if a clear demarcation of responsibilities and risks is made so that it is clear who bears which risk.

Yes, this is possible after we have given the technicians the correct training and have authorized them for assembly work on our components

Yes, as long as it only concerns the functionality of the screen.

- No (1 participant)

Do you have any other comments, suggestions or suggestions for improvement with regard to the specification?

- Yes (1 participant)

Suggestion: think carefully in advance about any adjustment or replacement of components in the circle of controlling components In the PVE, specify that in the event of a loss of the connection to the External Display Adaptation service, the screens must continue to function based on the locally stored (backup) information. Indicate whether, in the event of an outage, reference is made to the latest data on the screens (1 line number & 1 destination) or whether a local copy of the complete line number and destination database is required. Specify which service the system must subscribe to in order to operate the icon on the RGB block.

- No (5 participants)

3.2 Additional questions about the specifications during the interviews

During the discussions with the 7 participants in the market consultation, a number of questions were asked:

Do you believe that opting for LED at this stage is the best option with the requested lifespan of approx. 15 years or do you see possible better alternatives?

- Yes this is the best option (7 participants)

Do you have experience with powering LED screens with Power over Ethernet (PoE), could this be an option?

- We have no experience with that (5 participants)
Remarks: This option is probably more susceptible to interference (1 participant)
- This may be optional (2 participants)

The PoR does not currently contain a clear standard with regard to moisture resistance of electrical components. GVB still wants to insert this. The choice is between a clear standard (eg IP 20, IP 54) or a functional description. What has your preference?

- A functional description is sufficient (2 participant)
- Choose a clear minimum standard, this provides certainty and creates a level playing field (5 participants)
- Remarks: Do not choose a standard higher than IP54. That is overdone for this application (4 participants)

Questions about whether or not to reuse the existing housings of the screens

Does the application of your LED solutions in our own existing housings have an effect on the price? If so, what effect?

- Yes, this has a cost-increasing effect and makes it more difficult to apply our standard solution (2 participants)
- This could potentially reduce costs. We think of an impact of 15-25%. This does make planning and assembly work more complex. Suggestion. If necessary, leave this open as an option so that this can be offered
- Yes, this may have a cost-reducing effect, but please note that the housing only has a very limited influence on the total price. However, this choice may force us to deviate from standard products or cause us to adapt the existing housing. Possible temperature problems can also arise
- This could potentially reduce costs, but we can only give a good indication if we based on to be able to compare a detailed design for both options
- We rather expect a price-increasing effect, but please note that the housing has only a very limited influence on the total price. The existing housing will certainly have to be adapted and this makes the conversion more complex and more difficult to plan. Suggestion leaves this open and offers the possibility to offer this as an option. Make sure you have very detailed drawings of the existing containers or make a container available at the time of the tender
- This is a proven solution that can reduce costs by 25-45%. A point of attention is the other electrical components to be installed

Does the application of your LED solutions in our own existing enclosures have an effect on the certification of your products or the certification process? If so, what effect?

- No our screens are compliant with EN50155, this is independent of the housing in which they are mounted.
- We do not think this will have any influence, but do recommend that certification (including tests with regard to vibration and shock resistance) in accordance with EN50155 be included in the schedule of requirements (2 participants)

- Yes, certifying a composite product for which we are partly not responsible can cause complications with certification. Reuse of the old housing can also cause complications with possible future warranty issues
- If we manage to keep the weight comparable with the existing screens including housing, we see little risk
- Difficult to determine. Please note that the existing enclosures were certified under the then applicable standards almost 20 years ago. If we had to recertify a composite product with “old” housings, we could run into unexpected issues.

Summary and conclusions based on question

The supplied specifications are sufficient to be able to make a design / quotation. Participants made comments about matters that were indeed mentioned in the draft specifications, but there were certainly a number of things that were missed and opportunities for optimization. The participants have made good suggestions for this, which will be partly incorporated in the PoR. Sufficient time and space will be included in the tendering procedure for potential tenderers to be able to extensively inspect a Combino tram for dimensioning brackets, available mounting space for screens, checking cable routes, etc.

Reusing existing housings presents both risks and opportunities. Some of the participants see opportunities for sometimes substantial cost savings and some see this as an uncertain process that may be more expensive and has a number of risks that are difficult to control.

3.3 Questions about the chosen technology, technical lifespan, post-delivery terms for parts and warranty terms to be used for components to be used in this order.

GVB wants to assess whether the choice of LED technology is the most suitable solution or whether there are equivalent or better alternatives.

GVB also asked a number of questions to gain insight into the expected technical lifespan, post-delivery terms for parts and the guarantee terms to be used for components to be used in this order.

In your opinion, what is the expected technical life of the following parts. You should assume an effective operating time of 6000 hours per year:

• LED screens

• Connectors

• Cabling

- Lifespan Led Screens: 15-20 years (2 Participants)
- Lifespan Led Screens: 15 years (1 Participant)
- Lifespan Connectors: 20 years (2 Participants)
- Lifespan Connectors: 15 years (1 Participant)
- Cabling life: 20 years (2 Participants)
- Cabling life: 15 years (1 Participant)
- We can only indicate this after we have made a product and supplier choice. (1 participant)
- We can only determine the MTBF during the design process, but the expected remaining technical life of the Combino of approximately 100,000 operating hours can certainly be achieved. (1 participant)

- The expected remaining technical life of the screens is 100,000 operating hours (16.6 years). (1 participant)

If, when answering the above question, you indicated that the expected technical lifespan is less than 15 years, do you have any suggestions for the use of alternative materials / products that do have the requested technical lifespan?

- The expected lifespan of 15 years by GVB is realistic (6 participants)
- We can only indicate this after we have made a product and supplier choice. (1 participant)

GVB wants to be able to order spare parts for as long as possible. In your opinion, what is a realistic maximum time limit for the delivery of spare parts for the following parts:

- **LED screens**
- **Connectors**
- **Cabling**

- We can supply suitable alternative parts after parts have become obsolete (3 participants)
- We can supply suitable spare parts for the remaining technical life of the Combino. (1 participant)
- We can only indicate this after we have made a product and supplier choice. (1 participant)
- We can repair parts, but the turnaround time for a repair is a maximum of 8 months. Therefore, consider purchasing a stock of spare parts at the initial purchase. (1 participant)

In your opinion, what are the usual warranty periods for the following parts in this market:

- **LED screens**
- **Connectors**
- **Cabling**

- We can only indicate this after we have made a product and supplier choice. (1 participant)
- 24 months after commissioning and / or 36 months after delivery. (1 participant)
- An extended warranty of 60 months is possible at an additional cost (1 participant)
- 24 months after commissioning. An extended warranty is possible at an additional cost (3 participants)
- 24 months after commissioning. (2 participants)

3.4 Questions about market parties' interest in this assignment

Is your company interested in acquiring this contract?

- All 7 parties who participated in the market consultation indicate that they are interested in acquiring this contract.

If the answer to this question is yes: are you able to carry out this assignment independently or do you intend to carry out this assignment with subcontractors and / or in combination? Which parts of the assignment do you have a third party perform or with what kind of companies do you enter into a combination?

- Yes, we will carry out this assignment as a system integrator and are looking for a supplier who will supply us with the screens (2 participants)
- No, we supply the screens and are looking for a local partner to install the screens (5 participants)
Suggestion: indicate with which parties GVB has good experiences with installation work so that we can find a partner in time (3 participants)

During the discussions, the timeline is as GVB has presented to the participants. This is broadly as follows:

- ***Publication tender date to be determined***
- ***Period for inspection of trams, preparation and submission of quotation approx. 10 weeks***
- ***Provisional decision***
- ***Signing of the agreement approximately 4 weeks after the provisional decision***
- ***Delivery of proof of concept / Fat approx. 2 months after signing the agreement***
- ***SAT approximately 1 month after FAT***
- ***Conversion starts approximately 2 months after SAT, total conversion period is approximately 12 months***

The question was whether this planning is feasible for the participants.

- All participants indicate that this planning is feasible

The background of the logistics requirements has been presented to all parties. The question was whether these are a bottleneck.

- All participants indicate that they think they can comply with this.
- A number of parties must consult with a local partner to be selected for installation (4 participants)

3.5 Relevant comments and suggestions from participants

Participants in the market consultation made the following suggestions and recommendations.

- Provide more information about the power supply (1 participant)
- Indicate in the specifications whether certification in accordance with NEN50155 is necessary (1 participant)
- Build in a start-up / learn phase in the conversion process (1 participant)
- Build in a test phase in which 1 or more converted vehicles are also tested in operation for a period (1 participant)
- After awarding the contract, make a complete set of spare parts available for the current screens that the contractor may take with him to check the dimensions and connections of the prototype to be built. (1 participant)
- Avoid night work during the conversion, this increases costs (2 participants)
- Consider a smaller screen on the front. This can result in cost savings. (1 participant)
- As GVB, choose an installer yourself and contract this separately from the delivery of the LED screens. (1 participant)

3.6 Additional information in response to questions from participants

A number of participants in the market consultation asked GVB to indicate with which assembly companies it has good experience with installing electrical and mechanical components in rail vehicles.

Based on experiences in recent years, GVB has good experiences with the following parties:

- Alpatron Security B.V
Prins Hendrikstraat 10
4761 AH Zevenbergen
Nederland
R.Bischoff@alpatronautomotive.com
+31 (0) 85 00 654 32 / +31 (0) 6 485 193 65
www.alpatron.nl
- NS Service & Onderhoud (Nedtrain)
Laan van Puntenburg 100
3511 ER Utrecht
Nederland
materieelonderhoud@ns.nl
<https://www.ns.nl/over-ns/treinonderhoud/dienstverlening.html>
- Protect Effect b.v.
Netwerkweg 13
1033 MV Amsterdam
Nederland
dick@p-ct.nl
+31 (0) 6 520 366 43
- Strukton
Westkanaaldijk 2
3542 DA Utrecht
Nederland
info@struktonrail.com
+31 (0)30 240 72 00

4 Conclusions and recommendations for the design of the tender

Input provided by participants in the market consultation leads to the following conclusions and recommendations that could be included in the tender:

1. With regard to the specifications sent in the draft version:
 - According to the participants in the market consultation, the concept PoR is already of sufficient quality and a good basis for designing the screens and for estimating and discounting the installation process. A number of recommendations have been made by participants for additions and improvements.
 - A number of good suggestions are made for adjustments and additional information is requested on a number of components. Being able to physically pick up the trams is also very important.
 - Think carefully about whether or not to apply the existing enclosures and the opportunities and risks associated with this. Consider asking this as an option if necessary.
 - The points mentioned above will be included in the tender.
2. With regard to the chosen solution, the expected lifespan and common deadlines for subsequent delivery and warranty:
 - The solution in the form of LED screens has a lifespan (15 to 20 years) that GVB strives for. So this is a good choice.
 - Subsequent delivery for approximately 15 years seems feasible at almost all suppliers.
 - A warranty period of 2 years is common. Longer seems possible, but this has financial consequences. GVB can make a choice based on the input provided.
3. Testing interest in participating in the tender for this contract with potential suppliers.
 - All seven participants are interested in acquiring this assignment.
 - All parties must seek partners in order to be able to implement this project in its entirety.
 - The timeline and approach proposed by GVB is feasible for all participants.

5 Appendices

5.1 Market consultation document (including questionnaire and draft specifications)