

Innovative Public Procurement of Intelligent Transport Solutions City of Copenhagen

About this Best Practice Case

In recent years the City of Copenhagen set up numerous initiatives to achieve their goal of creating a sustainable and smart, innovative City for their citizens. One plan fostering these goals is the [Copenhagen Climate Plan](#). This plan has the very ambitious overall aim of being the first carbon neutral capital of the world by 2025. This best practice case presented here shows the steps towards the procurement of five intelligent transport solutions in one single contract getting the City of Copenhagen closer to the 2025 goal. The case also contains a description on how the City of Copenhagen used a close R&D cooperation with private stakeholders prior to the tender to help defining the objects of the tender and the overall methodology of the tender documentation.

Title: Procurement of ITS
Cluster Topic: Intelligent Transport Systems
Country: Denmark
Procuring Authority: City of Copenhagen
Procedure: Restricted Procedure
Directive: 2004/18/EC
TED: 2015/S 022-035425

Purchase of intelligent transport solutions for the City of Copenhagen

Key Points

- Purchase of five intelligent traffic solutions that among others will allow better traffic management in order to optimise mobility, sustainability and flexibility of the City of Copenhagen.
- This initiative is sponsored by Copenhagen Climate Plan.
- A Public Private Innovation Partnership (PPI) was used prior the procurement to define and prepare the tender. The PPI was carried out as a multi stage R&D project with private stakeholders in order for city to highlight and evaluate the opportunities and to be able to narrow down the scopes and start preparing the tender specification. The PPI was not a part of the tender itself, but it paved the way for determining the tender.

The Procurement Objectives/Background

Brief description

Copenhagen is known for its high number of bicycle lanes, citizens using sustainable transport modes (walking, biking, public transport), lots of business, green space and therefore its high living quality. The City managed to reduce its CO2 emission by more than 20% in the last 10 years, but they do not stop there.

The vision of the City is to be the world's first carbon neutral capital by 2025. To reach this goal Copenhagen started several specific initiatives, some of them requiring collaboration between the public and private sector. The initiatives all complement each other:

“All initiatives complement each other synergistically. Climate efforts must be seen in a broad perspective. It's not just about reducing CO2 emissions. It's also about improving air quality, giving the city's inhabitants room to move, setting better standards for our homes, work place, and cultural life, entering partnerships with businesses. Engaging and inspiring Copenhageners so that we all take on responsibility.”¹⁷

Included in these initiatives is the transport sector, selected to make up for 10% of planned CO2 reduction. Within the climate plan the transport sector is split up in 15 different sub-initiatives reaching from supporting sustainable transport modes, effective car use, climate-friendly taxis, rerouting traffic, congestion charges, intelligent street lightning to the Intelligent Transport Systems (ITS). These systems are becoming a more and more important tool for cities, regions and transport authorities to achieve their goals of a more sustainable, secure

¹⁷ Copenhagen Climate Plan – The short version, p.3, URL: <https://www.energycommunity.org/documents/copenhagen.pdf>

and efficient transport system for the citizens. ITS will “optimise the city’s traffic signals to the benefit of bicyclist and busses, and GPS-transmitted parking opportunities reduce congestion from drivers on the hunt for a parking space”¹⁸.

The ITS tender described in this best practice was supported by the Copenhagen Climate Plan.

In general the City of Copenhagen wants to address the following points with the use of ITS¹⁹:

- i) Mobility and green transport – Improved mobility and traffic flow for all types of road users
- ii) Traffic safety – Use of ITS solutions to improve traffic safety
- iii) The street adapts to the rhythm of usage – Flexible use of street space
- iv) Data and traffic management –
 - Collection and processing of real-time data about traffic
 - Overview and strategic traffic management
 - Active management of traffic incidents
- v) Information and Services – Better and more updated information through the appropriate channels

Reasons for this procurement

The tender described in this case should be a step stone to achieve the described climate goals. To reach the goals the City of Copenhagen wanted to implement new intelligent transportation solutions.

When planning the forthcoming tender, the project management concluded that the specifications for a new Traffic management system (CTMS) and systems for signal optimization might be specified in detail due to accessible knowledge of solutions already existing on market, including some off-shelf solutions and known practices.

However, the other objectives of the ITS solutions needed were more abstract as no plug and play solutions existed on the market. As it was very difficult or impossible to describe the technical requirements and innovative aspects of a solution that does not yet exist – you do not know what the market could come up with or not – the city needed to clarify its needs and to gain insight into the market prior to drafting the tender documentation.

To handle these obstacles the City of Copenhagen carried out a Public Private Innovation project (PPI²⁰) prior to tender in a view to narrow down, define, and specify the scope and specifications for the final contract to be tendered. The PPI process narrowed down eight potential focus topics to five – being the five contract topics to be tendered:

¹⁸ See above p.11

¹⁹ Better mobility in Copenhagen (2014), ITS Action Plan 2015-2016, URL: <https://www.kk.dk/sites/default/files/uploaded-files/ITS%20-%20Action%20Plan%202015-2016.pdf>

²⁰ Although using the term “Public Private Innovation project (PPI)”, the collaboration is about research and development (R&D). In this connection, PPI must not be mixed up with the term “Public Procurement for Innovation” – also abbreviated PPI, a term used for the wide range of approaches to procurement of innovation.

The five contract topics:

1. *mobility and green transport;*
2. *traffic safety;*
3. *data and traffic management; and*
4. *traffic information and services.*
5. *dynamic urban space;*

Re. 1 Mobility and green transport

The project must ensure that the City of Copenhagen lives up to the political decided service goals for transport as described in the Traffic Management Plan. There is furthermore focus on two projects under this topic: traffic signal optimization and eco-driving.

Re. 2 Traffic safety

The contractor must develop, implement and evaluate a intelligent lighting in five intersections. The task includes the development of software for building an interface that enables the street lighting network can be operated from the city traffic management platform (see below).

Re. 3 Data and traffic management

Contractors shall implement a city transport management system (CTMS) that will enable the City of Copenhagen to monitor transport more effectively and intervene when events occur as well as planning and implementing scenarios for optimizing transport. The service includes a network of sensors that also shall ensure improved real-time data to help arrive at an overview of the transport situation and contribute to better transport information.

Re. 4 Traffic information and services

The contractor shall develop, implement and evaluate a variable message signs for bicyclists. The sign must provide cyclists with relevant real-time information. The service comprises:

- developing and designing the bicycle sign so that the Police and the Danish Road Directorate can approve;*
- testing the product; and*
- implementing the displays on several routes.*

Re. 5 Dynamic urban space

The contractor should develop ideas and technical concepts for how urban space can be used more dynamically. In developing the concept, users shall be invited to participate to ensure that the concept can be easily understood and meets local wishes. This task is an option in the tender.

The following tasks are included in the contract:

- consultancy;*

- *supplying hardware and software development;*
- *small construction projects; and*
- *operating and maintaining equipment and systems.*

Regarding operating and maintaining equipment and systems:

The contract will include a contract on the operation and maintenance of the equipment and systems covered by the contract. There will be an option to extend the contract regarding operation and maintenance for 2 years beyond the fixed contract period of 24 months.

Innovative Aspects

What was procured is innovative:

The sum of topics and initiatives contained in the tendered contract helps the City of Copenhagen to reach its climate goals – being CO2 neutral in 2025. The approach on creating a cleaner environment through technology, ITS initiatives, and behavioural changes of how to move in the traffic can be seen as a “state-of-the-art project - being an inspiration to and a pilot project for other European cities.

The procurement process itself is innovative:

Using a prior R&D-process (PPI) involving private potential suppliers, universities and service users to help defining the objectives of the contract and technical specifications instead of using a dialogue based procurement procedure, e.g. competitive dialogue, is a way of utilising the legal framework for R&D-procurement and market consultations as a pre-phase of the procurement phase. The results of the PPI are unique and the planning and process towards the final tender must be seen as innovative.

The Procurement Process

The PPI process (R&D-collaboration)

To gain knowledge on the market, the potential suppliers, solutions available, market directions on innovation etc. the City of Copenhagen decided to initiate a research and development (R&D) project prior to the tender, involving private stakeholders and users. The form of R&D project is named Public Private Innovation Partnership (PPI) – established in compliance with the exemptions rules of R&D procurement in the 2004/20/EC procurement directive art. 16 (f).

Thus, instead of initialising an unformal market consultation the city decided to enter into a formally cooperation with private stakeholders – having as it's goal to gain results and benefits for all parties in the form of knowledge on innovation trends in the field of ITS for city environments. Furthermore, for the private suppliers participating in the PPI project the PPI provided valuable knowledge on where the City of Copenhagen were aiming in terms of the future tender – but also in terms of commercial potentials towards other customers.

The kick-off for the PPI in June 2013 was a public workshop with the participation of 40 private suppliers and universities. In the kick-off workshop the participants were invited to participate in full PPI project, concentrated around 7 workshops on 8 different themes. 16 private suppliers and universities accepted the invitation and joined up in 8 interdisciplinary teams with the goal of developing and testing ITS solutions on the 8 chosen themes:

1. Extra lightning on bicycle lanes
2. Street life in parking areas
3. Better traffic flows in the streets
4. Box senses the pulse of the street
5. Busses on time
6. The park have to be emptied in 20 minutes
7. Cyclist rides on the green wave

The 7 workshops had the following themes:

Workshop 1-2: Scoping & teams

Workshop 3: Problems, needs and potentials

Workshop 4: Inspiration and ideation

Workshop 5: Ideation & business case

Workshop 6: Prototyping and ideation

Workshop 7: Pitch & next steps

The different concepts created by the teams were tested in the spring 2014. The tests were carried out in different ways reflecting the different range of proposed solutions, e.g. physical proto typing and computer simulation of intelligent bus prioritisation. The tests and the final evaluation of the PPI, carried out by an external consultancy company, paved the way for the decisions on scopes and specifications in the forthcoming EU tender procedure.

Between workshop no. 1 and no. 2 the participants all signed an R&D framework contract regulation i.a. remuneration for participation, IPR, state aid and precautions on how to avoid incapacity and lock-out in the forthcoming tender by making all information (foreground knowledge) public.

The procurement procedure

The procurement phase began in January 2015.

Due to the detailed knowledge on the ITS solutions collected during the PPI, the restricted procedure was chosen. A restricted procedure includes a prior limitation on the number of tenderers (prequalification) who will be invited to participate in the tender. In this case the number of tenderers was limited to 5. The restricted procedure may be a good choice of procedure in relatively complex tenders, comprising full and complete described specifications, but where a reduction of participants is needed due to i.e. resources of both the procuring authority and the participants. The prequalification is based on objective pre-qualification criteria for choosing the limited number of candidates. In this case to following criteria were used to limit the number of candidates:

“The selection process will emphasize the economic and financial capability and the technical and professional capability of the tender applicants. The applicants with the best and most relevant experience in relation to the tasks being tendered will be especially emphasized.”

Only pre-qualified tenderers were invited to file a bid.

The contract award criterion of the final tender was “the most economically advantageous tender” based on the following weighted sub-criteria:

Sub-criterion	Weighting
Technical Solution	45%
Economy	25% Range between 50.000.000 and 70.000.000 DKK
Process and organization	20 %
Support and maintenance	10 %

Key Reasons for using the Restricted Procedure in this Procurement

See above.

Pro and Cons of the used procedure

Using the restricted procedure presupposes that the procuring authority is able to specify all its needs and is able to finalise the tender documentation to full extension as goes also for the open procedure. Thus, the restricted procedure is a relatively fast two stage procurement procedure, with only one bid phase. Contrary to open procedure the restricted procedure narrows down the number of tenderers – and thus reducing potential waste of resources at both supplier and procurer side by limiting the number of bids to be drafted and evaluated. Thus, the restricted procedure will – under normal conditions – be more attractive to potential suppliers as chances of winning are optimised.

Like the open procedure, the restricted procedure does not open up for dialogue or negotiation – apart from the possibilities for the tenderers to ask questions in writing on the tender documentation. As a rule the restricted procedure is not an obvious procedure for innovation procurement although the procedure very well might support procurement of innovation if it includes sufficient open/functionally based specifications – and being supported by a throughout market investigation prior to the procurement.

Key Results

Contract tendered

The city of Copenhagen received four bids. The contract was awarded in August 2015 to the Dutch main supplier Technolution BV with a number of sub-suppliers. The contract value was estimated to EUR 6.4 mio.

The contract included a phase divided delivery of solutions in each of the five contract topics, with the first phase being a clarification phase, including workshops and an innovation friendly project organisation, and the last phase being the phase's operations and maintenance.

The duration of the contract is 2 x 2 (option) years.

Key Lessons Learnt

Major Barriers

1. At the time publishing the tender, it was not considered possible to use a dialogue based procurement procedure (negotiated procedure or competitive dialogue) due to very strict interpretation of the former procurement directive. As a consequence hereof, either open or restricted procedure had to be used.
2. Notwithstanding the PPI carried out prior to the tender, it was a challenge to define in detail all aspects of the tender and contract. This takes up some time and resources from the technical and legal expertise in order to prepare the tender material.
3. Procuring innovation is always risky, as you are procuring a solution that does not exist. This will add significantly layers of risk. The PPI helped to investigate the market capabilities and ensure that the solutions are doable. This helped limiting the risk of the project.
4. Finally it is worth mentioning that there is not much room for changes in this classical contract, and all the changes and adoptions are costly.

Lessons learnt

1. The City was very precise about what exactly is needed. However, this also limits the room for adjustment or changes in future. It was considered to have a clarification phase in order make room for some modifications after the contract was signed.
2. Another challenge is the extent of the required solution. Although the solutions were presented as a package, there was no single supplier who can deliver it all. Therefore, there was a need to establish a consortium of suppliers in order to be able to deliver the whole solution. This will furthermore add to the risk of the project, and it requires the main supplier able to ensure the coordination across the topics and various suppliers.
3. Generally this is a very complex IT project with a number of innovative projects which also adds to the complexity with an inherent risk.

References and Further Information:

1. Tender documentation is available in English at:

<http://ted.europa.eu/udl?uri=TED:NOTICE:35425-2015:TEXT:EN:HTML>

2. Copenhagen Climate Plan

<https://www.energycommunity.org/documents/copenhagen.pdf>

2. Copenhagen ITS Action Plan 2015-2016, URL:

<https://www.kk.dk/sites/default/files/uploaded-files/ITS%20-%20Action%20Plan%202015-2016.pdf>