Your light on 040

YOUR LIGHT ON 040

MAKING EINDHOVEN SMARTER TOGETHER

INNOVATION PROCESS: AN EVALUATION YOUR LIGHT ON 040

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Research report – July 2020

INNOVATION PROCESS:
AN EVALUATION
YOUR LIGHT ON 040

SYNOPSIS

The Municipality of Eindhoven and the Signify/Heijmans consortium have jointly decided to prematurely terminate the contract for the 'Your Light on 040' ('Jouw Licht Op 040'). There are several reasons for ending the contract. The aim of this evaluation is on the one hand to gain a good understanding of these underlying reasons, and on the other hand to be able to work together in the future to realise the existing vision. The wish of the principals is for this evaluation to be carried out thoroughly.

To realise these primary goals, the researchers at TU/e carried out 22 individual interviews with key figures from the various organisations involved in the project (Municipality of Eindhoven, Signify, Heijmans and TU/e) and organised two evaluation sessions with residents. A phased analysis was then carried out using this input. Fifteen learnings were defined, based on the perspectives and rich experiences of all those involved. These learnings were translated into a total of eight recommendations for future partnerships. The report therefore looks both back (what could we have done better?) and forwards (how can we do it better?).

We hope that this publication will also help others who are working on or considering similar journeys.

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CONTENTS

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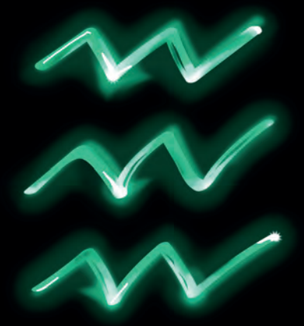


YOUR LIGHT ON 040

MAKING EINDHOVEN SMARTER TOGETHER

INTRODUCTION

In the 'Your Light on 040' (JLO040) project, the challenge was how 'smartening' public lighting – alongside the replacement, management and maintenance of the lighting system – can improve living quality in the city of Eindhoven. The Municipality of Eindhoven has been working intensively in this project since November 2016, together with the Signify/Heijmans consortium, TU/e, residents and businesses. In this unique form of partnership, which also actively involves residents, the participants jointly explore ideas and opportunities for innovative (lighting) applications in public spaces. Five Living Labs, distributed around Eindhoven, were designated to experience smart lighting and related smart new technology and design, with the aim of improving the quality of life in the city.

The wish to actively involve businesses, educational institutes and residents in the innovation process, as well as the consortium partners themselves – the so-called Quadruple Helix – has proved in practice to be more challenging than was originally anticipated. Collaborating to achieve the jointly defined societal goals requires more time and specific professional expertise than was first thought. Partly for this reason, the speed with which concrete products and services can be realised is lower than was first planned.

The Municipality of Eindhoven and the Signify/Heijmans consortium jointly decided to prematurely terminate the contract for the 'Your Light on 040' project with effect from 1 December 2019.

There are a number of reasons for ending the contract. The aim of the evaluation, as described in this report, is to gain a clear understanding of what these underlying reasons are, and to be able to continue working together in the future to realise the existing vision regarding smartening public lighting. The Municipality of Eindhoven and the Signify/Heijmans consortium want to carry this evaluation out thoroughly. TU/e has offered to make this evaluation, with the following three main goals:

- To ensure that the experience gained is soundly embedded in knowledge about this innovative partnership and working approach.
- To conclude the partnership in a positive manner while at the same time maintaining the ecosystem intact for future co-operation.
- To learn how innovative project tenders and new forms of partnership in comparable innovation processes can be put into effect.

This publication first describes the background to the project, followed by the research approach and the results.

Source: jouwlichtop040.nl

YOUR LIGHT ON 040

BACKGROUND

The 'Your Light on 040'[1] project was the logical successor of the Vision and Roadmap Urban Lighting Eindhoven 2030, which was set up in 2012, and was defined as official policy document later in that year.

The Vision and Roadmap show that public lighting and the related smart cities domain are areas in which numerous developments take place. To make good use of those developments, it is important to ensure that tenders are designed to be future-proof. The Municipality of Eindhoven therefore decided to issue a tender for the public lighting infrastructure in the form of a 'public utility'. This would allow a range of innovations to be implemented under this 'public utility' principle for the duration of the project. In the tender invitation, the participating companies were asked to indicate how they would achieve continuous innovation in the different Living Lab settings in the city. The tender was won by the Philips/Heijmans consortium (since 2018 Signify/Heijmans) with a Smart City Continuous Innovation Process[2].

THE INNOVATION PROCESS IN THE LIVING LABS

Discussions were already held with residents and other stakeholders during the tendering process. Following the contract phase the consortium started on setting up the project. It was given the name 'Your Light on 040' to underline the importance of involving residents.
The 'Smart City Continuous Innovation Process' was further developed into a concrete approach to be implemented in the five selected Living Labs (three residential areas and two traffic routes). To keep the workload at an acceptable level and to be able to use learnings to improve the process, it was decided to start a new Living Lab each half-year.
The total process consists of four phases:

1. Replacement of luminaires with LED
In this phase the existing luminaires were replaced with 'connected LED' products so that all light points are individually controllable. This forms the basic infrastructure: the smart lighting grid.

2. Identifying needs and opportunities
In this phase TU/e carried out independent research into the needs. This uses different research methods and involves different target groups (residents, users and businesses in the area). The aim was to gain the most complete possible picture of all the areas involved, both attractive and less attractive, and of the opportunities for innovative solutions based on the smart lighting grid.

3. Directions and solutions
In this phase ideas were generated that offer solutions to the identified needs or ways to realise the opportunities. The consortium and the municipality worked closely together in this phase with residents, students at different educational institutes and businesses in an open innovation process. The solutions that were found could be submitted through the website, after which they were evaluated on a number of aspects:

- Alignment with the identified needs by means of a survey among residents and stakeholders.
- Alignment with the project goals, carried out by the municipality, consortium and TU/e.
- Societal value of the solution, carried out by the municipality.
- Business potential of the solution, carried out by the consortium.

This evaluation showed which solutions score highly. One or more solutions were then chosen to be implemented in the Living Lab.

4. Implementation and assessment
In this phase the solution was implemented, where necessary permits were applied for and the solution was then realised. The effect of the solution was also assessed by measurements both before and after the implementation of the parameters on which the solution was intended to have a positive impact (e.g. social cohesion or traffic flow).

The earlier than planned ending of the project means that not all these phases have been completed in all the Living Labs. Descriptions of the results gained in the Living Labs can be found in the reports which can be downloaded on:
www.tue-lighthouse.nl/SmartlightEHV.html
www.jouwlichtop040.nl

[1] den Ouden, E, & Valkenburg, R. (2012). Vision and Roadmap Urban Lighting Eindhoven 2030. Eindhoven University of Technology
[2] Brock, K., Voncken, R. & den Ouden, E. (2016). Creating Continuous Smart City Innovations. Eindhoven University of Technology

RESEARCH APPROACH

SCIENCE-BASED APPROACH

The evaluation of the innovation process is based on a scientific approach. The qualitative research method focuses on identifying, through the use of interviews, the learnings and partnership dynamics in the 'Your Light on 040' project. The emphasis here is on the Quadruple Helix (QH) innovation process and the implementation of innovations in the period from 1 November 2016 to 1 December 2019. A total of 22 interviews were conducted with a balanced group of respondents. A list of key figures was drawn up in advance together with the principals. Additional key figures were added during the discussions. Next to the interviews, two evening sessions were organised to evaluate the project together with residents. The results were then validated in presentations and meetings with those involved in the municipality and the consortium.

The transcriptions of the recorded interviews have resulted in 466 pages of text. This information has served as the basis for the analysis. The transcriptions are anonymous, without showing the names of the respondents and organisations. This form of analysis shows the most objective possible picture. The analysis was carried out in six sessions over a period of four weeks: three afternoon sessions of over five hours, one afternoon session of three hours and one whole-day session of over seven hours. This resulted in almost ten man-days of analysis time.

FACTS & FIGURES

- 22 respondents
- 4 organisations (Municipality of Eindhoven, Signify, Heijmans and TU/e)
- 1627 minutes of interviews
- 2 residents' evenings
- 466 A4 pages of transcriptions
- 10 man-days of analysis + 10 man-days of reporting
- 1st round clustering: 26 themes
- 2nd round clustering: 15 learnings from the project
- 8 recommendations for future co-operation

ANALYSIS PROCESS

The results consist of two kinds of learnings: 15 learnings gained directly from the analyses and the interviews (see page 14), and eight recommendations (see page 16) for future co-operation projects based on these learnings.

The first analysis round led to a rich set of (26) themes. These were then combined in a new analysis round into (15) learnings. The learnings look back at the process (what could we have done better?). They are entirely based on the different perspectives and rich experience of the interviewed key people representing all the involved organisations (Municipality of Eindhoven, Signify, Heijmans and TU/e). At least five key people were interviewed per organisation from the municipality and consortium partners. As well as these key people, the perspectives of (3) external involved parties were also included. All learnings were referred to by multiple respondents from different organisations. This means that these learnings are not just relevant from a single perspective. Each of the learnings is explained (pages 18 – 47) by a brief but rich description.

A list of interviews in which the subject is named is given with each learning. The relevant quotes are used to capture the richness of the information, and to illustrate the different perspectives. This ensures that the results are identifiable and recognisable by those involved.

Based on combinations of the learnings, a number of recommendations were identified and formulated in the following analysis round (pages 48 – 55). Special attention was given in this step to looking ahead (how can we do it better?). The eight recommendations are described by statements together with explanations.

The learnings arise out of the insights revealed by different key people in the interviews. The learnings can be presented and understood separately, but should be interpreted as a coherent whole in the context of the 'Your Light on 040' project.

RESULTS

15 LEARNINGS

The overview on the opposite page shows the 15 points that emerge from the project.

These learnings are presented in more detail on pages 18 - 47. The description of the learnings is based on the (anonymous) quotes from the interviews, in which an effort was made to preserve the richness of the information that was given.

1

EMBEDDING THE LEADERSHIP

At project level, (the lack of) innovative leadership is difficult to manage

2

SHARED UNDERSTANDING

Different interpretations of the goals contribute to misunderstandings and confusion

3

EQUAL PARTNERSHIP

An innovative partnership requires empathy towards the other partners and a good understanding of your own contribution to the process

4

INDEPENDENTLY OPERATING TEAM

Innovation is all about people – it requires the right, inherently motivated team members with enough mandate, who can work together to build a shared DNA and memory

5

MOBILISING THE INTERNAL ORGANISATION

Being able to respond to external changes demands breaking down internal silos and rigid organisational structures

6

THE UNPREDICTABILITY OF INNOVATION

Innovation needs space to experiment and learn, dynamic planning and flexibility in the approach

7

FEASIBILITY IN PRACTICE

It's hard to find the right balance between high ambition and a project that can be practically executed

8

BALANCING OPPORTUNISM AND REALISM

A request for an innovative tender in a competitive procurement process may attract opportunistic offerings

9

ROLE OF RESIDENTS

It's difficult to get residents involved in the preliminary phase of innovation, and to give them an equal role

10

COORDINATING THE PLANNING

Time pressure in the project leads to a forced fit of strategic developments and solutions for the identified needs

11

MOBILISING THE INNOVATION ECOSYSTEM

Too few other parties recognise the opportunities of an 'open innovation ecosystem' and are willing to invest time in it

12

KPIs FOR INNOVATION

Managing on KPIs instead of on innovation output (valuing process over content) leads to people focusing increasingly on the KPIs

13

FLEXIBILITY IN THE CONTRACT

A complex process with multiple possible interpretations can unintentionally lead to the higher goal being pushed into the background. This could result in people holding back in their behaviour

14

THE RIGHT CONTEXT FOR INNOVATION

Without urgent societal needs in the Living Labs, the necessary context for innovation is missing

15

ROBUST FINANCIAL MODEL

A financial model must be robust to allow disappointing results to be dealt with

RESULTS

8 RECOMMENDATIONS

The overview on the opposite page shows the 8 recommendations that can be taken from the combined learnings.

These recommendations are described in more detail on pages 48 – 55, including their relationships with the learnings.

The grey italic numbers refer to the related learnings.

LEARNING 1 Embedding the leadership

Innovation requires strong, inspiring leaders. These were present at the start of the project, but the 'pioneers' gradually left and their replacements did not always have the same level of enthusiasm. This led to problems in the project. The various partners all experienced similar difficult periods at different times. In a number of cases people wondered whether the project actually made enough contribution to the (in some cases changed) strategic ambition of the alliance, or if it needed to be taken in a different direction to bring it back on track. This led to tensions in the steering group, but also at the operational innovation level, where the project team was trying to execute the complex process. In a number of cases there were misunderstandings between the steering group and the project team, for example because decisions were taken in the project team (the Quadruple Helix board) that were overruled by the steering group for reasons that were unknown at project level.

Changes are unavoidable in a long-term process. This means that every innovative project has its ups and downs, and there will always be criticisms. So effective leadership is important, with the ability to ensure that there is always a strong team, even when there are changes in the team members. The question that arises from these challenges is: how can you embed leadership for innovation, independently of the people involved?

At project level, (the lack of) innovative leadership is difficult to manage

LEARNING 2 Shared understanding

A 'smart lighting grid' has already been mentioned in the Vision and Roadmap for Urban Lighting. Because this is a new concept – and therefore is not clearly defined – there can be many different ideas at the same time about what it really means. Does it include the infrastructure, hardware, software and services? Is it all about 'light', or is it broader than that – for example, what about applications in traffic or sensors to monitor air quality? Is a solution innovative if it answers a need that has not yet been clearly defined? Can it be something that has not yet been applied? Or is it only innovative if it is economically viable and scalable? Many different organisations and parties are involved in the project: different departments of the municipality and the companies in the consortium, the residents and businesses in the Living Labs, and all the different companies that have worked on solutions. During the evaluation, it became clear that there were many different interpretations of what the goals of the project are, and of what a 'smart lighting grid' really is, all existing in parallel. This situation regularly proved to be an obstacle to the project – and certainly also for the communication to the outside world, for example with residents and other stakeholders.

Because new members are constantly joining the project team, it is important that there is a clear, shared understanding of what 'innovation' on a 'smart lighting grid' really means, and that this can be simply and clearly communicated, so that all the expectations continue to be aligned with each other. The question is: how can you create a shared vision and understanding for a new and complex concept like this?

Different interpretations of the goals contribute to misunderstandings and confusion

LEARNING 3 Equal partnership

Developing innovations for a smart lighting grid requires an equal partnership, in which all participants make full use of their strengths to create the complementary working relationship that is needed to realise the desired innovation. Both the businesses in the consortium and the municipality have an important and active role to play.
But in practice it proves to be difficult to get a good understanding of each other's interests and capabilities. The necessary active, connected approach proved to be absent at crucial times, with participants falling back into their classical customer–supplier roles. All parties began to show risk-averse behaviour, emphasising their own responsibilities and focusing on their own interests instead of on those shared by all. This led to a marked slowdown of progress in different areas. All these factors caused recriminations in all directions, which meant that the participants did not present themselves as a single, coherent team dedicated to realising the project goals.

The question that arises from these observations is therefore: how can you set up a partnership based on equality and respect, with an understanding of each other's interests and capabilities.

An innovative partnership requires empathy towards the other partners and a good understanding of your own contribution to the process

LEARNING 4 Working independently as a team

Many of those who were interviewed mentioned that the innovation team did not have enough resources and/or capabilities, and that there was not enough competence and/or a lack of knowledge about the innovation process among the participants, or that competent people were assigned to the wrong roles. As well as that, another issue for the team was that it did not have enough mandate to take decisions by itself. The plans and decisions had to be discussed in different places (for example in the steering group and the route planning group), which slowed the project down. Changes in the team also proved to be disturbing, because the replacements were often less involved and did not share the team's collective memory. The contract was too abstract to provide a good frame of reference, so it constantly had to be explained, which then again led to a lot of discussion.

But despite these problems, a number of the key players proved to be intrinsically strongly motivated, and despite all the obstacles and tensions they faced, they did their best to make the project a success.

Changes in the team are unavoidable, but how can you – with the intrinsically motivated people that you have available – create a team with a mandate, that can operate independently as far as possible, and that can deal effectively with new people?

Innovation is all about people – it requires the right, inherently motivated team members with enough mandate, who can work together to build a shared DNA and memory

LEARNING 5 Mobilising the internal organisation

The interviewed people stressed that the project experienced problems because all the partners are large, complex organisations, within which it proved difficult to get people moving for the project. At one time or another, each of the parties had significant problems to get people from different departments actively involved. The limited budget was also a factor. The desired innovations actually demand cross-departmental cooperation to make an impact, but it proved difficult to break through the silos in those organisations. All the organisations underestimated the internal co-ordination and activities that are needed to deal with new external questions like these, and to respond actively to changes.

To create really innovative solutions, working together with many different departments from the different organisations is essential. So the question is: how can you mobilise all those internal organisations so they make an active contribution to the project?

Being able to respond to external changes demands breaking down internal silos and rigid organisational structures

LEARNING 6 The unpredictability of innovation

The initial ideas about how to approach this kind of innovative process together with residents and other parties have become part of the contract. That meant it was no longer possible to deviate from this approach, or to experiment. The first ideas on the innovation process with residents and businesses unintentionally became a blueprint with a tight time schedule, instead of being used as a flexible underlay around which the process could move, because in fact no manual had yet been written for innovating with residents in a Quadruple Helix process. A number of those interviewed stressed that a much looser, less tightly controlled process is needed for a project like this, with the space to find out how things work and to learn from mistakes. This demands trust, a bold approach and dynamic planning. It is also important to be able to show enough progress to keep people engaged and involved.

Innovation is inherently unpredictable, this requires a more flexible approach. An approach in which there is still enough space to experiment and to learn. So the question is: how can you organise a project like this, taking into account the unpredictability of the innovation process?

Innovation needs space to experiment and learn, a flexible approach and dynamic planning

LEARNING 7 Feasibility in practice

The high, inspiring ambition created a lot of positive energy at the start of the process (the tender phase). Those who were involved in that phase say there was a tremendous drive, with a real feeling of building on each other's strengths and expertise. All partners involved aimed to create valuable solutions. However, in practice, it proved challenging to achieve the initial high ambition, especially under time pressure. As the project approached realisation, the partners had to comply to established procurement rules and legislation and encountered difficulties to materialize the high ambition. A regular subject arising in the discussions was that the project might have been launched too soon, because a number of important elements were not yet 'ready'. And on the other hand, it was often said that if you really want to build something innovative, you need time to do it – time to deal with the municipality on permits and regulations, as well as for the technical realisation by the consortium. The project faced challenges due to the gradual loss of inspiration and energy during execution.

Because a high ambition could be very inspiring, the question is: how to organise a realistic project in which the inspiration can be maintained, even with the inevitable setbacks that may arise during the execution?

It's hard to find the right balance between high ambition and feasibility in practice

LEARNING 8 Balancing opportunism and realism

Many of those interviewed indicated that the project's high ambition initially gave them energy, but it was challenging to maintain their enthusiasm within the tightly structured tender process. In this project, a request for an ambitious innovative tender was linked to a tightly limited budget. In the competitive phase of the tender process, this complicating factor placed great demands on the selected parties in relation to what they would actually be able to deliver in their offer. This led more or less right from the start to the fault lines on which the project finally hit the rocks. In essence, an impossible split arose because both the client and the contractors almost entirely failed to discuss the large (possibly too large) gap between the wish list and what was realistically achievable.
The initial energy was regarded as too valuable to lose by getting into deep and realistic discussions with each other. But even then, the mutual trust was gradually breaking down, while at the same time agreements needed to be made about a process that was still very uncertain.

The question is: how can you drive synergy with a high ambition while simultaneously maintaining realism for the different parties in a competitive tender process?

A request for an innovative tender in a competitive procurement process may attract opportunistic offerings

LEARNING 9 Role of residents

Creating an involved community and getting residents involved in the preliminary phase of innovation (certainly with something as abstract as a smart lighting grid) was underestimated. Right up to today no agreement has been reached in the project team about whether the role given to residents and the methods used are the right ones. In addition, there were also numerous external disturbances that got in the way of the process (e.g. discussions about privacy legislation, changes in the Owners' Association of the apartment block, and the discovery of bats). Although the involvement of residents is regarded important to ensure support in the local area, the way this was achieved did not give the residents an equal role. The process took too long – you can't keep residents actively involved for two-and-a-half years. Finally, even though decisions about whether or not to implement solutions in the Living Labs were taken on the basis of input from residents, they were not actually involved in taking those decisions, even though they had been expected to make a significant contribution in terms of their (free) time.

The question that arises is: how can you give residents a full role in an innovation process, so it also makes sense for them and gives them satisfaction?

It is difficult to get residents involved in the preliminary phase of innovation, and to give them an equal role in the process

LEARNING 10 Coordinating the planning

The evaluation clearly shows a conflict between business innovation roadmaps and the co-creation approach. Businesses are already strategically developing solutions based on their own roadmaps – which of course are also based on information about what the market and end-users really need. However, the co-creation in the project followed a different approach: research was carried out in the Living Labs to identify specific needs, which were then used to initiate innovations. At the same time the project was subject to a tight time schedule (implementing an innovation in the Living Lab within a year), while the normal innovation process takes much longer. The lack of synchronisation of these processes is regarded as a major obstacle to success. This leads to forced linking of solutions (which are already in the strategic roadmaps, or are already 'on the shelf') and the actual needs in the Living Labs.

The question is: how can you better align the longer-term development roadmaps with the shorter-term project planning, so innovative solutions are better matched to the needs of residents in a Living Lab.

Time pressure in the project leads to forced fit of strategic developments and solutions for the identified needs

LEARNING 11 Mobilising the innovation ecosystem

The contributions of external parties to the project were less than expected. This applies to the creative industry, other businesses and knowledge institutes, as well as to the residents. The expectation at the start was that many more people and businesses would have a much more active involvement in generating and realising solutions. Building a viable ecosystem requires more effort than was initially foreseen. A number of reasons are identified: it may be due to the fact that (smaller) companies do not want to work for other commercial parties (in this case the consortium) because they are afraid that those other parties will steal their ideas. Or it may be due to the lack of budget to develop use cases for creative applications. Also, was the initially intended role, for example for residents and knowledge institutes, realistic? But the fact is that the flywheels for the ecosystem never really got started, despite the high expectations and the belief that it would bring with it new financial models.

The question is therefore: how can you successfully set up an open innovation ecosystem, and who needs to take the initiative to ensure independence, as well as that the financial models for all parties are soundly based.

Too few other parties recognise the opportunities of an 'open innovation ecosystem' and are willing to invest time in it

LEARNING 12 KPIs for innovation

Almost all those interviewed stressed that from a certain point the project was too greatly managed by the KPIs (Key Performance Indicators). The accent shifted from content to process (KPIs) as a result of the tensions that affected the project. The procedures had become more important than the content. This was attributed partly to the changes of people in the project, which hindered group learning and meant there was a tendency to fall back on what was stated in the contract. But it was also due to the need for good, transparent 'management' of the contract (which is financed partly from public funds). Managing an innovative process in this way raises a lot of questions, because regulations, procedures and KPIs were all defined on the basis of past knowledge. They are not helpful for innovation, and even proved to be counterproductive as trust leaked away and the focus shifted from the really important in-depth activities to what is needed to 'tick the boxes' on the KPIs checklist.

KPIs are certainly important for contract management, so the question is: how can you formulate KPIs in a way that they stimulate innovation instead of hindering it?

Managing by KPIs instead of by innovation output (valuing process above content) leads to a stronger focus on the KPIs

LEARNING 13 Flexibility in the contract

The contract proved to be a big obstacle to the execution of the project and the achievement of the high ambition. The project itself was very inspiring, because of its higher and challenging goal. But the contract, in contrast, was used as a rigid management tool. This caused the planning to come to a standstill, taking away all the flexibility. And because there were no back-up scenarios, the parties were trapped and all the energy in the project was lost. Indicative processes and proposals for approaches that were conceived during the tender phase became part of the contract and were given fixed delivery dates, even though they were never designed with that idea. Changes in the contract were not possible because of the tender rules. The complexity of the contract also meant that it was subject to multiple interpretations, offering room for the different parties to put the emphasis on completely different aspects. This made people take a hesitant stance, holding back in their behaviour because they did not have enough background knowledge, or did not agree with the chosen interpretation.

The question is therefore: how can you make a contract for a higher ambition that is sufficiently clear and at the same time allows flexibility in the process.

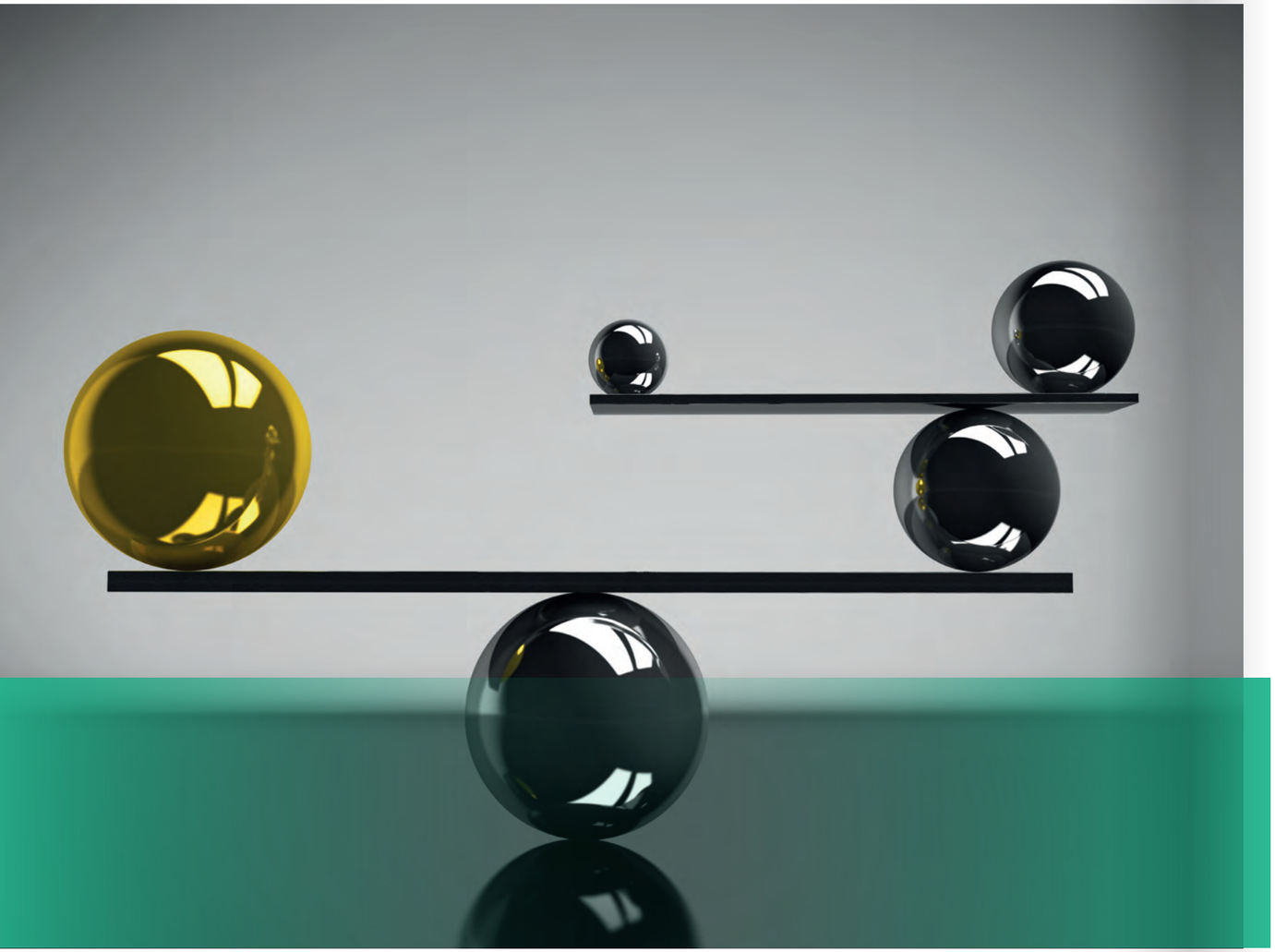
A complex process with many possible interpretations can unintentionally lead to the higher goal being pushed into the background. This could result in people holding back in their behaviour

LEARNING 14 The right context for innovation

The Living Labs were selected on the basis of the need to replace the lighting fixtures. Many of those interviewed questioned this choice, because it did not represent areas where there are significant actual societal problem or something for which innovation is urgently needed. And in any case the public lighting is not really a problem that residents are highly aware of, which makes it difficult to get many people engaged – the involved residents themselves also said it was difficult to get more people from the neighbourhood involved. The lack of urgency was considered a problem because this means there is no clear guidance. The needs that were found were also said to not really support scalable innovations, because other cities were most probably not willing to provide funding for needs with such low priority and low added value.
In addition, the identified needs in the neighbourhood may indeed have been relevant, but on the scale of Eindhoven this was often not the case (for example the road crossings in the Living Labs were regarded as unsafe, but there were also many more places in other neighbourhoods that were considered to be more dangerous – so it doesn't feel right to solve the unsafe crossings here and not in those other places).

The question that arises here is: what is the right context in which to handle innovation for a smart lighting grid and to achieve the high ambition.

Without urgent societal needs in the Living Labs, the necessary context for innovation is absent



LEARNING 15 Robust financial model

The project relied on a complex financial model, with three interrelated parts to generate the required budget for innovation: the replacement of outdated luminaires, energy savings through more economical solutions, and additional revenues for the consortium through preferred suppliership projects. Even though no direct budget for innovation was provided by the municipality, this innovation was actually their most important focus. During the implementation, some of the activities proved to be greatly underestimated in terms of both the required personnel to carry them out as well as the costs. And when the preferred suppliership proved to be below expectations, the available budget for innovation was limited and the innovation engine failed to get started. Although at operational level people repeatedly continued to make their best efforts to achieve small successes – sometimes even against their own better knowledge. At the steering group level, the question of financial viability played an important role because the financial model did not work well enough due to insufficient funding from the preferred supplierships.

The question that arises is: how can you set up a financial model that can deal with the risks of lower--than-expected results of one of the components of the project. Make sure that you allocate budget for innovation, and that this does not depend on whether or not other components are successful.

The financial model must be robust enough to ensure that lower-than-expected results can be dealt with

RECOMMENDATION 1
High ambition requires sufficient resources

A high ambition requires the right resources to prevent a constant need to make concessions.

Looking for a suitable approach and continuous experimentation – inherent aspects of innovation – are difficult to plan in advance. They demand flexibility and the ability to improvise. Working together with different partners and involving other parties takes time and needs a lot of organising (see Learning 11). The experimental nature of innovation means that things can turn out differently from what was expected, or that activities may need to be carried out that were not expected at the start (see Learning 6).

A robust business model requires flexibility to allow the use of increasing understanding and insight (see Learning 15).

RECOMMENDATION 2
Partnership requires strong leadership

Good partnership in an ambitious project demands strong leadership.

Strong leadership ensures both connection through all layers of the project and broad support in the local community (see Learnings 1 and 5). It is important to select the right team members, who can look beyond their own interests to achieve the shared goal (see Learnings 3 and 4). These team members must be able, both independently and together, to set out the road towards that goal (see Learning 7), if necessary even outside the organisation, so they can follow their own route.

A (pro)active network in people's own organisations is an important prerequisite for that partnership.

RECOMMENDATION 3
Innovation requires harmony and alignment in the content of the topic

A smart lighting grid is a new concept about which people can easily have different interpretations and expectations.

To create a strong basis for shared innovation, the partners involved need to take the time together to create a shared understanding of what innovating on a smart lighting grid really means (see Learning 2). As well as that, the roles and interests of all those involved must be clear, so they can be really complementary (see Learning 3), and together to open up many more opportunities (see Learning 8). There will always be increasing understanding and insight in a longer-term process like this, and there will always be people coming and going, so this will need constant attention. A broad ambition means it will be easier for new people to join in, although constant (possible) shifts of emphasis need to be avoided (see Learning 1).

An in-depth shared understanding will help to guide both the process and the partnership.

RECOMMENDATION 4
High ambition requires manageable opportunism

A regular reality check is essential to make the project manageable and to keep it manageable.

The project partners want to use the full potential of a high ambition by setting the bar high, but without encouraging opportunism (see Learning 8). The process gains inspiration (see Learning 7) by creating clarity about what the partners really want to achieve (see Learnings 2 and 14) and by managing on that detailed goal (see Learning 12).

An in-depth check like this will inspire people and will constantly motivate them to innovate.

RECOMMENDATION 5
Innovation requires flexibility in the approach

Innovation requires an approach that moves flexibly with the – still unknown – outcome.

The contract must ensure that the goal is defined, but at the same time that there is flexibility in how that goal will be reached (see Learning 12). This allows alternative scenarios to be created if there are new insights or disappointments (see Learning 6). The goals and ambition must be clear. As the approach may change, the underlying goal must remain clearly visible (see Learning 13).

An approach in which alternative choices can be made in case of increasing understanding and insight has a motivating effect and keeps progress moving forward.

RECOMMENDATION 6
Smart lighting grid innovation requires de-linking of the platform and the applications

A smart lighting grid consists of infrastructure and hardware, together with the applications that run on this platform. However, each of these components requires a different innovation approach, and probably also different partners.

The city has to take responsibility for the roll-out of a smart lighting grid as a 'public utility' (see Learning 2), and needs to ensure that this grid is available as an open platform. Once the basis has been established, (other) parties can then start working to develop applications to run on it (see Learning 11).

A leader who can easily switch between different parties and can operate independently of commercial profit is essential to ensure trust in the ecosystem (see Learnings 11 and 15).

Disconnecting these processes, responsibilities and roles creates clarity for other parties in the partnership.

RECOMMENDATION 7
Useful innovation requires synergy in societal needs and technical solutions

Useful innovation starts with the needs of residents but can only succeed if the innovation agendas of businesses can play a full role in the innovation process.

The insights within the (latent) needs of residents can enrich the strategic roadmap for new market solutions (see Learning 14). The business strategies can serve as a guide to the viability and scalability of new solutions (see Learning 10). Synergy of insights in both these areas can support a creative discussion about the usefulness and viability of use cases, with the value of all parties being respected (see Learning 9). Partnerships with other cities (both national and international) can help to validate the demand side and to include scalability right from the start.

Useful and viable innovations are built on good synergy between supply and demand.

RECOMMENDATION 8
Tendering for a high ambition requires a specific form of contract

A tender is unavoidable, because cities must comply with (European) regulations. Opting for an open dialogue form was logical, because the innovative nature of the tender meant that it was not easy to capture it in a more traditional, result-focused tender invitation. The competitive element of an innovative tender may make the parties feel challenged by others to 'over-bid' (see Learning 15) so that they win the tender. At the same time, a positive interaction can arise between the parties in the open-dialogue process. This can lead to the participants and the party issuing the tender lifting each other's game in a way that inspires the high ambitions to achieve great plans. However in translating this ambition into a contract, the risk arises that this can become unworkable (see Learning 13). The tender process for a high ambition can create an uplifting atmosphere, led by the drive to jointly build a successful result, so it becomes hard to create a realistic contract – a contract that ensures both the realisation of the shared ambition and the concrete goals.

A tender process for a high ambition requires extra care in the translation into a contract with realistic opportunities for all parties while still living up to the shared ambitions.













ACKNOWLEDGEMENTS

'Your Light on 040' was a unique project, in which many people from different organisations, together with residents, created innovations on a smart lighting grid. It was a project with a high ambition that required a different approach and placed great demands on the participants. It unfortunately did not prove possible to bring the project completely to realisation. There were many reasons for this, as described in this report, even though all those who were involved would have gladly seen the project becoming a big success. However, everyone involved felt that the learnings gained from the project are also a highly valuable result.

As far as we know, there are no comparable projects that were so ambitiously conceived, and in which innovation played such an important role. The ambition of creating innovative solutions that would improve the quality of life in the Living Labs, and after that worldwide, still stands. We hope that the learnings and recommendations will motivate many to continue innovating and through trial and error to find significant solutions for many challenges.

As researchers in the Innovation, Technology Entrepreneurship Marketing group of the Department of Industrial Engineering & Innovation Sciences, we have a strong interest in innovation processes. Students in many departments and TU/e innovation Space were happy to carry out a range of research projects and to design new solutions for the Living Labs. Various research projects by the Intelligent Lighting Institute and others have been carried out around the project. For us the project was a rich source of inspiration and an incubator for many societal research questions and challenges for student projects. A total of more than 300 students and researchers in a range of roles have been involved.

We would like to thank all those who contributed to the project, and we hope that the future will once again bring more of these inspiring and challenging projects.

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Numerous people were interviewed for this evaluation, and two residents' evenings were held. We would like to sincerely thank everyone for their open attitude and critical but constructive feedback.

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