

## **Breda University of Applied Sciences**

### **Research accreditation Academy for Built Environment & Logistics Research**



## Preface

This report contains the results of the evaluation of the quality and the organization of the research groups of the Academy for Built Environment and Logistics (ABEL) of the Breda University of Applied Sciences (BUAs). It is based on the performance and results in the period 2013 - 2019. The external evaluation committee that has performed this evaluation was commissioned by the Academy for Built Environment and Logistics of BUAs, in consultation with Netherlands Quality Agency (NQA). NQA has screened the committee members regarding their independence and expertise.

The evaluation committee consisted of:

Drs. S.J.C.M. (Stef) Weijers, chairman and expert in the domain of Logistics as emeritus professor of Logistics and Alliances at HAN University of Applied Sciences.

Mrs. drs. E. (Elke) Bossaert, committee member and expert in mobility management and strategic planning as Strategic Accessibility Manager at Brussels Airport Company.

Mrs. drs. M. (Maud) Hensen, committee member and expert in the domain of Built Environment as Team manager Bachelor Built Environment at Zuyd University of Applied Sciences.

Mrs. dr. Meg van Bogaert, auditor NQA, acted as secretary of the committee. See appendix 3 for further information regarding the expertise of the committee members.

The research accreditation of the research unit Built Environment and Logistics is performed in line with the *Sector Protocol for Research Quality Assurance 2016-2022* of the Netherlands Association of Universities of Applied Sciences.

### *Evaluation performance*

To prepare the audit visit, the evaluation committee received and studied a documentation set from ABEL. This documentation set comprised a critical reflection report and a representative selection of the (research) products and publications that the research unit has produced (appendix 1). The selection represents the different research lines within ABEL and represents the overall output. The documentation enabled the evaluation committee to form a good first impression of the research unit.

Before the actual (virtual) visit of the committee, members had shared their impressions and addressed the main topics for further questioning during an MS Teams meeting. The actual audit visit took place on April 8<sup>th</sup>, 2021. Due to the Covid-19 pandemic, the actual audit visit was also held via MS Teams. During this virtual visit the committee had meetings with several stakeholders (see appendix 2). All (oral and written) information has enabled the committee to reach a deliberate judgement.

### *Structure of this report*

This report is set up in accordance with the five standards of the *Sector Protocol for Research Quality Assurance 2016-2022* and it describes the committee's findings, deliberations, conclusions and recommendations.

The characteristics of BUAs and of ABEL are outlined in chapter 1. Chapter 2 addresses the findings and conclusions regarding the five standards of the protocol. The judgements given are described in chapter 3. Chapter 4 presents the related recommendations.

The committee declares the assessment of ABEL was carried out independently.

Utrecht, June 28, 2021

Committee chair



Professor Stef Weijers

Committee secretary



dr. Meg van Bogaert

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# 1. Short Outline of BUAs and the Academy of Built Environment & Logistics

The Breda University of Applied Sciences (BUAs) is ambitious and has the goal to be an 'international leading knowledge institute with industry-relevant, high quality and innovative education and research'. For research, this ambition is specified in one of the milestones to be reached by 2021, namely 'the focus in the research is in line with industry needs and has produced visible and demonstrable exposure for BUAs as a knowledge institute, nationally and internationally'.

In 2012 the Knowledge Development & Research strategy of BUAs was defined, gradually leading to increasing numbers of lecturers who were assigned time for conducting research and participating in external projects. The researchers and lecturers of the five academies of BUAs, covering eight domains, collaborate in a multidisciplinary setting in joint research projects across the academies. BUAs has introduced three central research themes in 2017, to which each academy and Research Group must contribute:

- a. Designing, measuring and managing experiences.
- b. Placemaking and shaping destinations.
- c. People and goods on the move.

The Academy of Built Environment & Logistics (ABEL) is one of five BUAs academies where education and research are organized. It contributes to all three themes. ABEL offers three bachelor's programmes (Logistics Management, Logistics Engineering and Built Environment). The annual enrolment in the bachelor's programmes is approximately 300 students per year. In February ABEL started the master programme International Supply Chain Management with an expected annual enrolment of around 20 students. Research education is considered a core part of the curricula. Researchers are heavily involved in research education, and the applied research in education is based as much as possible on real-life case studies, commissioned through ABEL's research network.

Many developments took place in the past six years, for example the renaming of NHTV to BUAs in 2018 and the renaming of the academy from SLM (Stedenbouw, Logistiek and Mobiliteit) to ABEL, to match the international ambition and orientation. The current Research and Business Innovation Department (RBI) was formerly called AIC (Advice and Innovation Centre) and KD&R (Knowledge Development & Research).

The research context of Built Environment (BE) differs from that of Logistics (LG) in terms of scope of research questions and innovation, involvement of industry and educational programmes. Research areas of BE link to spatial planning, mobility, and urban design. With a professor in Urban Intelligence, the portfolio has developed since 2015 towards the creation of knowledge on cycling, mobility behaviour and the interaction between land use and mobility. Furthermore, research furthermore made a move towards international networks. The LG research has also developed over the past years from mainly focusing on human capital development, to supply chain visibility becoming more dominant, for example with the

professorship of Smart Cities & Logistics. There are, however, also crossovers that generate opportunities. To further develop these is an ambition for the future.

Important in the LG research is the partnership with Eindhoven University of Technology, 'Nederlandse Defensie Academie (NLDA)' and Tilburg University in 'Logistics Community Brabant' (LCB). LCB is located at the BUas campus, ensuring close cooperation with ABEL.

The ABEL expertise areas have developed over time, leading to seven current expertise areas (3 LG, 3 BE and one shared) that have been developed in cooperation with the education managers and industry representatives. In the previous years the research capacity was around 12.4 fte. In 2019 and 2020 ABEL deployed 32 employees in research, two of whom are professors.

BUas participates in the KennisDC Logistics (KDCL), a national network of seven universities of applied sciences, regional authorities and industries. The network aims at alignment of applied research in logistics, strengthen collaboration and fosters societal value and economic spin-off. Furthermore, at university level, BUas is a partner in the national Centre of Expertise for Leisure, Tourism and Hospitality (CELTH). CELTH's goal is to identify trends and developments in the hospitality sector and to initiate cooperation between industry and education. Extension of the cooperation with ABEL might offer new possibilities.



## 2. Standards

In this chapter the evaluation committee describes the findings, considerations and conclusions on the five standards of the *Sector Protocol for Research Quality Assurance 2016-2022*.

### Standard 1

*The research unit has a relevant, ambitious and challenging research profile and a research programme with corresponding targets that are substantiated within several indicators.*

#### Research profile and research programme

The three BUAs wide research themes aim at interdisciplinary research collaborations across its five academies and are 1) Designing, measuring and managing experiences, 2) Placemaking and shaping destinations, and 3) People and goods on the move. ABEL researchers are involved in and even initiated projects in the first two themes, for example by way of the Experience and Design Lab. The third theme, People and goods on the move, is led by ABEL and activities include a BUAs wide minor, a test with automated vehicles in the village of Drimmelen and a pilot project with an automated delivery robot on the campus. According to the Committee, these - and other - examples clearly indicate that ABEL's research fits in well with the broad BUAs profile. The three overarching research themes are currently being reviewed by BUAs. In doing so, BUAs focuses on defining new themes on academy-transcending research with core attention to the domain specific academies that are responsible for education.

ABEL translated the BUAs strategy in its own vision, strategy and performance indicators. Combined, these themes lead to the following ABEL positioning: ABEL strives for excellence by means of excellent education, innovative knowledge development & organizational excellence. The academy focuses on designing, planning, structuring and managing the spatial environment, and the supply chain implications within this environment. ABEL has defined seven areas of expertise that developed over time. All expertise areas involve the triple helix of industry, research, and education, though with a different emphasis, priority and focus of one expertise area over the other. Over the past period, ABEL has been working on bringing focus to the research. Seven expertise areas have emerged from this. Conditions for research include that it must be financially feasible and that there is a clear link with education. The expertise areas with highest priorities are *Urban Intelligence* and *Smart Cities & Logistics*. Both are led by a professor for content leadership. The second group of expertise areas have a good interaction in the triple helix and are led by a senior researcher and/or might develop into a professorship in the future. These areas are *Smart & Sustainable Mobility*, *Capacity Management* and *Supply Chain Visibility*. The final two expertise areas are *Dynamic Urbanism* and *Intermodal Transport*. These are considered important areas content-wise but have no dedicated leadership yet at ABEL or necessary external funding.

The research context of BE differs from that of LG in terms of scope of research questions and innovation, involvement of industry and educational programmes. BE research traditionally focuses on activities of people and their interaction with physical space. It has the overarching goal of achieving and maintaining 'quality of life' and minimising negative impacts in the public domain. LG research was originally leaning towards the production and distribution of goods, to

optimize industrial and commercial processes. The differences in focus have resulted in the development of BE and LG along different lines. Initially, LG research and projects outnumbered the BE activities. Since 2015 the BE research portfolio has grown, especially in an international setting, leading to a number of activities comparable to LG.

The committee considers the research profile of ABEL to be relevant for the professional partners and for education. The expertise areas are well chosen, and some areas show clear and impressive ambition and impact. Despite its relevance, the committee wonders if the profile might be too diverse for ABEL to cover the full breadth in high quality research. Although – by prioritizing some expertise areas – ABEL recognises this challenge of breadth and depth, the commission did not get a clear impression of the potential of the two least prioritized areas in relation to the overall ambition.

The research profile of ABEL is twofold. According to the committee, the research both in BE and LG research is relevant for education and the professional practice. Despite the relevant and ambitious research profile, there seems to be a lack of coherence in the research portfolio. Initially, the two parts within ABEL (BE and LG) did not seem the most logical combination to the committee, but there are clear opportunities for added value and synergy. From the critical reflection, the interaction seemed very limited, even within the crossover expertise area *Smart Cities & Logistics*. Increased integration was also mentioned as an ambition for the upcoming period. From the meetings during the virtual visit, the committee understood that cross fertilization between LG and BE is indeed limited, which is considered a minor shortcoming by the committee. At the same time, there are many connections with other domains (academies) within BUAs. The alignment of ABEL's research agenda with that of other academies is supported by the committee. This is already resulting in some interesting, interdisciplinary projects.

The committee draws the conclusion that the focus of ABEL is more on developing promising research rather than on strategic programming. The research team considers current trends and works in an agile way to meet new standards and requests from both industry and government. At the same time, the committee recommends focusing on finding synergy and creating connection between LG and BE more on the basis of a shared vision on the function of RBI towards the professional field and education, sharing experiences and developing new methodology (learning communities), than merely on the content of the research. Because, finding any synergy should not be at the expense of high-quality research and impact on education and innovation in professional practice. They come in the first place.

Without wanting to describe or impose the strategy or approach to take and which choices to go with it, the committee advises ABEL to draw a consistent line between the ambitions of the academy and the research portfolio. If ABEL's mission is indeed to strengthen the interaction between LG and BE, the committee recommends to clearly and explicitly formulate a strategy and conditions to achieve this. The Logistics Centre of Expertise (CoE) has already a steady history and is preparing for the future with new programming; ABEL takes part in this process. Although RBI's experiences with its CoEs are not described in depth in its Critical Reflection Report, collaboration in CoEs can be a proper way to meet these restrictions, by bringing in expertise on a broad field that is not available at BUAs yet. The committee recommends taking advantage of such a kind of cooperation with peers in the same domains across the country, or abroad.

## Research indicators

ABEL's vision on research was translated into specific goals for 2018-2021 in its academy plan:

1. Researchers and lecturers contribute to both research and education.
2. Knowledge is developed by means of projects that aim to improve the quality of the educational process.
3. Knowledge development focuses on the expertise areas formulated.
4. Staff members have different roles, and a team of researchers complements each other in terms of talent.
5. Students are involved in projects together with a variety of national and international industry partners.
6. ABEL strongly emphasizes community learning with industry partners.
7. The research initiatives have a strong international orientation in scope, content and partnerships.
8. The research initiatives are recognised by the industry and will lead to new connections and projects.

These goals are translated into KPIs for ABEL's research for the period 2018-2021. According to the committee, there is a good process in place to enable the monitoring of the research performance. The committee is positive about the eight beforementioned goals that resulted from the vision, they are very relevant for ABEL's research. However, the committee did not find a clear overview of performance goals and quality indicators that does justice to the objectives of ABEL. The committee misses a clear link between these goals and the very general KPIs. The committee understands that the KPIs are BUAs-wide indicators that are included in the annual management report. However, the committee is of the opinion that these KPIs are not well focused on the research performed at a university of applied sciences. The academic steering with the current KPIs does not seem to help ABEL any further. The committee recommends ABEL and BUAs to develop a new system of monitoring impact which is much more based on the rate of co-productions, community learning, the process (frequency of contact, real-time monitoring etc.) and reflecting process. Focus should not lie on the number of academic articles or the amount of funding, but rather make clear that the research has impact on partners, that the academy interacts with these partners and that the results are of mutual benefit, rather than one direction. Although this is not an easy task, the committee is convinced that it will benefit ABEL and BUAs.

## The research profile - Relevant, challenging and ambitious

The committee finds the research profile highly appropriate for a University of Applied Sciences. The vision of ABEL on the function of research is very strong: contributing to its education and to innovation in professional practice. The support of internal and external stakeholders for ABEL's research activities is also outstanding. The focus on *community learning*, that is initiated BUAs wide, fits in well with the ideas and ambition of ABEL. Increasingly, students, lecturers and researchers are collaborating with representatives of industry to share and develop knowledge during research and other projects.

There is a clear connection between the BUAs mission and the research in the academy. From the meetings with ABEL and BUAs representatives, the committee concludes that not only is the ABEL profile aligned with the BUAs mission and vision, but there is also active collaboration

across academies to deal with the complex challenges of the interdisciplinary field that is covered in BUAs, for example with the Academy for Leisure & Events on the safe organization of events in 'Field labs'.

The committee has the impression that ABEL researchers have relative freedom to develop their own profile. If a topic triggers a researcher, he/she can propose to initiate or participate in a project with (external) stakeholders. The committee was informed that in the past years more focus was aimed at. Although the committee does observe an increase in focus on major themes, the research profile is still very broad and diverse. According to the committee, this might be caused by the fact that the research profile (at least partly) seems to be developed based on interests and expertise of the current team rather than driven by the research agenda itself. The research team has a lot of flexibility in deciding on the topics for research. This is very positively evaluated by the researchers themselves and it provides the team with a positive drive. To assure alignment with the academic profile and BUAs mission, participation in projects has to be approved by the academy management. Although the committee appreciates this bottom-up approach that stimulates intrinsic interests of the researchers, it might hamper the further development of a coherent long-term portfolio. This flexible and personal development of the research portfolio indeed has major value, but also entails a risk in the sense that in case researchers suddenly leave BUAs, the research programme becomes unbalanced. During the virtual visit, the RBI manager seemed to be well aware of this risk.

In the midterm review it was recommended to install a RBI manager in the management team of the academy. This was realised in 2015 and through the RBI department, the research activities and back-office were professionalised. The committee observed close collaboration between the RBI manager, research leaders and lecturers. There is a high degree of flexibility, goodwill and a supportive environment in which research can flourish.

## **Conclusion**

The committee concludes that the research vision, mission and ambition of ABEL are very good and well aligned with BUAs' policy, mission and vision. The ABEL profile is highly relevant for the professional partners and for education, but according to the committee, too diverse to fully cover the breadth with high quality research in all research areas. Collaboration in Centres of Expertise can be a proper way to meet these restrictions. Within BUAs there are many cross-links between ABEL research lines and other academies. The committee did, however, notice a lack of coherence in the content of research between BE and LG. Like ABEL, the committee does see opportunities for synergy, but more in terms of process and methodology, than only in the content of its research.

The somewhat scattered portfolio results from the bottom-up initiatives by research staff, the research team capitalizes on current trends and requests from industry and government. This approach works well for the research staff and leads to interesting, relevant, and impressive research projects. At the same time, it makes it difficult to keep the research portfolio coherent on the long term. The committee is positive about the ABEL goals, which are relevant for the academy and emphasize the connection between research, education and industry. There is a mismatch, however, with BUAs-wide KPIs. The committee recommends developing a new and fitting system of monitoring quality and impact of the research.

Based on above mentioned considerations the evaluation committee assesses standard 1 as **satisfactory**.

## Standard 2

*The way in which the unit is organized, the deployment of people and resources and the internal and external collaborative links, networks and relationships enable the realisation of the research profile.*

### Organization

Since 2017 BUAs has invested in a reorganization to make education and research equal partners. One of three advisory committees of the Executive Board is the Research Committee (RC), composed of the RBI managers of the five BUAs academies, the head of the Library department and two policy advisors. Professors from across BUAs also participate regularly in these meetings. The RC addresses issues such as strategy for research, knowledge development policy issues and cross-academy collaboration.

At ABEL, the Academy Director is responsible for the quality of education and research. The RBI manager is a member of the management team of the academy and reports on research staff, staff development and budget. The RBI manager has regular bilateral meetings with the education managers to synchronize the involvement of research and education capacity and student assignments.

In the academy there is a close connection between research and education. The education teams of LG and BE regularly organize 'study days' to which the researchers contribute, for example on opportunities for interaction between research and education and involvement of industry partners. In addition, monthly RBI team meetings have been organized since 2020 to promote knowledge sharing and to discuss practical issues. Finally, to communicate with a wider audience within BUAs, 'PIP' lunches are organized 4-5 times per year in which both a BE and a LG presentation are given on ongoing projects. The committee considers that the combination of researcher and lecturers in ABEL works very well.

According to the committee, the organizational structure of the academy is described clearly, with outlines of the roles of relevant persons as well as their integration in the management structure. The organization provides a foundation for implementation of research and is supportive in terms of the execution and assurance of the research programmes. At the same time, senior researchers informed the committee that a structured attitude does not naturally prevail within ABEL. The positive side is that this leads to many initiatives and beautiful projects. At the same time, some structure is needed. The committee recommends developing a light version of the organizational structure that resonates with those involved, providing sufficient structure and leave enough room for initiatives. A large role is attributed to the RBI manager (for example yearly performance reviews), but the managerial role of the professors seems limited. This requires a very high and constant level of sensibility, mutual respect and intensive contacts between the key players. The committee has the impression that this indeed is the case, but may be at risk in case persons leave and others enter.

### Deployment of resources

The academy has been active in research and knowledge development for many years. To manage this, two key challenges have been identified: to ensure sufficient research funding, and to balance the workload of the staff concerning their research tasks on the one hand and their educational tasks on the other hand. On the basis of a 'multitool', ABEL plans the education and

research efforts of its staff on a yearly basis, ending in an annual work plan for each individual staff member. The total expenditure for research consists mainly of deployment of people and an out-of-pocket budget for cost items.

In table 1, an overview is provided of yearly incomes raised by primary, secondary, and tertiary sources of funding. The total turnover of RBI research activities is one million Euro per year approximately, covering the size of 11 FTEs. Primary funding concerns about 15% of the budget, and is being used for internal, strategic BUAs projects only. Secondary funding covers 50% of the total budget approximately; it consists of grants and subsidies from (inter)national public-sector organizations. Particularly international grants have increased in budget over the past four years. Tertiary sources of funding include contracts with national and international clients for the performance of applied research; it equals 35% of the budget approximately. Finally, increasing budget is obtained from other sources, for example indirect contributions from other academies and/or LCB.

Funding sources	2017	2018 <sup>30</sup>	2019	2020 <sup>31</sup>
Primary sources (academy)	€17,000	€180,000	€160,000	€54,000
Secondary sources (subsidies)	Nat. €483,000	Nat. €121,000	Nat. €150,000	Nat. €104,000
	Intern. €28,000	Intern. €306,000	Intern. €224,000	Intern. €360,000
Tertiary sources (contracts)	Nat. €683,000	Nat. €198,000	Nat. €460,000	Nat. €283,000
	Intern. €215,000	Intern. €72,000	Intern. €140,000	Intern. €28,000
Total from external sources	€1,409,000	€697,000	€974,000	€775,000
Other sources	n/a	€22,000	€16,000	€110,000
Total research funding	€1,426,000	€899,000	€1,150,000	€946,000

Table 1: Annual funds available for research and knowledge development (2017-2020).

30: LCB started in 2018, leading to a drop in secondary and tertiary funding and an increase in other sources.

31: 2020 figures are in draft.

The financial figures show that ABEL manages to attract large amounts of external funding, which is impressive and an indicator of quality. At the same time, income from the different categories of sources all show large fluctuations over the years. The fact that many staff members are involved in teaching and research, provides some leeway to match the deployment of staff within the academy to the income. The committee notices that participation in projects is based on strategic and of course on practical choices, but did not get a clear view of the way ABEL positions itself in the first explorative gatherings with partners, in terms of processes. The committee values that ABEL has initiated activities to operate more strategically. Nowadays project participation is discussed at management level. The committee was pleased to learn that ABEL is explicitly not focusing on short-term projects and funding but tries to plan long-term projects, such as Horizon 2020. These large projects are not easy to acquire but provide some sustainability in income. The committee realises that sometimes it is wise to step in for short-term projects, but only in case it is assumed that it will create a steady basis for a long-term interesting programme that fits in with the long-term strategy of ABEL and supports the vision and ambition of ABEL.

## Deployment of staff

Since 2015 – when the RBI manager was appointed – many changes have been made concerning the staffing of research. The RBI manager is responsible for guiding and facilitating research within ABEL in terms of staff, focus, quality, and business development. The RBI manager is also key in establishing links with other academies. The RBI manager leads the team of support staff, professors and researchers, including lecturers who contribute to research. ABEL concludes that its total research capacity remained stable between 2017 and 2020 – nevertheless its funding substantially fluctuated over the years.

	2017	2018	2019	2020
Professors (FTEs)	3 (2.6 FTEs)	1 (1.0 FTE)	2 (1.4 FTEs)	2 (1.4 FTEs)
Researchers <sup>32</sup> (FTEs)	30 (11 FTEs)	30 / (11 FTEs)	30 (11 FTEs)	30 (11 FTEs)
Number PhD (%)	4 (13%)	4 (13%)	4 (13%)	6 (20%)
PhD candidates	3	4	4	5
Support staff (FTEs)	2 (1.5 FTEs)	2 (1.5 FTEs)	2 (1.5 FTEs)	2 (1.5 FTEs)

Table 2: staff resources for research projects.

RBI indicates that its team consists of members with a variety of talents (research, education, project management and acquisition) and seniority. A professor is appointed for each of the two domains: 0.4 FTE for Logistics and 1.0 FTE for Built Environment. The professors – together with the RBI manager – are responsible for the quality and focus of the research. ABEL anticipates that more professors will be appointed in the current and upcoming strategic periods, but no concrete steps seem to have taken. It stresses that not all expertise areas have the same priority, and therefore, some should not require a professorship. Researchers are encouraged to do a PhD, and the percentage of finalised PhDs is gradually increasing. Five PhD candidates finalized their PhD in the past year. In 2021 two or three new PhD candidates are likely to start. In this way, ABEL aims at ensuring continuity. The committee appreciates the opportunities and support of staff wishing to pursue a PhD, although it realises that it will take effort to reduce risks of PhD tracks becoming too academic and moving away from their applied character. To facilitate PhDs alongside the development of a professional doctorate programme is a great opportunity to develop further.

Research time is allocated to researchers in consultation with the persons involved and in line with their teaching load. Approximately (and on average) two-thirds of the time of the research staff is dedicated to research, one-third to education. In addition, many lecturers contribute a small part of their time to research, approximately 2 FTE in total. This means that many lecturers complement the work of the researchers.

According to the committee, ABEL manages to not only attract substantial funding, it is also able to hire well-equipped and skilled research staff. The committee is particularly positive about the close connection of research and education in the academy: doing research helps the researchers/lecturers to get actual insight and immediately translate it into well-funded education. This construction helps BUAs to prepare students best for their future professional position.

ABEL's policy is to limit the period for appointing professors. On the one hand, the committee understands this policy, it ensures continuous renewal of the research. On the other hand, it makes ABEL vulnerable in keeping its expertise in house and have a long-term focus and



strategy. The committee proposes to consider to make this policy less absolute and to deviate in certain cases. Added to that, appointing an extra professor – as suggested by ABEL - could create more continuity in terms of a team of professors, also reducing this vulnerability.

### **Network and external relation**

ABEL has close industry relations. Not only does ABEL deliver new professionals to the market, but industry partners also support the teaching process by hosting placements, providing guest lectures and by raising research questions and real-life case studies. The connection to and interaction with the large network of alumni is currently being improved through the 'connection to the industry' pillar in the current corporate strategy. The committee stimulates ABEL to indeed work on the alumni-network. By including alumni in the wider ABEL-community they can act as partners in education and research.

ABEL has numerous partnerships with smaller and larger organizations, with agreements based on a multi-annual grant between BUAs and the partner that includes not only research but also connects the partner to an educational programme. In addition, partnerships have been developed with other knowledge institutes in the Netherlands, like Tilburg University, Eindhoven University of Technology and TNO. The educational programmes are part of a national network of universities of applied sciences. These networks mainly operate in education, although exchange of experiences and joint research is an ambition for the future.

Furthermore, ABEL has a continuously growing (inter)national network with different levels of cooperation. In addition to direct education linkage (ErasmusPlus), ABEL collaborates with various universities, cities and private partners in national and international projects, for example University of Cambridge, University of Wuppertal, UPC and CIVITAS network (network of European cities). Finally, ABEL is active in various external educational activities, for example the summer school with CEPT University (India). The committee considers the internal and external collaborative links, networks, and relationships a strength of ABEL. The academy develops relevant and highly intensive networks of relationships, both regarding research and education. These collaborations make research project involvement not only possible but create opportunities for greater levels of success and more positive outcomes.

The committee noticed that ABEL strongly values entrepreneurship, which leads to short lines to the professional field. This is reflected in the good students, good researchers, and good network in the academy. The committee thinks that this is one of the strengths of the academy. A pitfall might be that the research and academy rely on the (net)work of individuals, leading to a vulnerable situation if people leave. The committee recommends ABEL to emphasize this risk within the organization. The committee particularly wants to mention LCB as an important partner of ABEL. The academy clearly benefits from the collaboration with LCB (which is located at the BUAs campus) and vice versa. The RBI manager regularly discusses new projects with LCB, including the value for and potential contribution by ABEL researchers. If a project fits the ABEL research area, then a connection is made. One of the advantages of the collaboration with LCB that was mentioned by ABEL, is the flexibility of LCB to take up and execute short-term research projects, while ABEL focuses rather on longer-term projects. Given the restrictions of its research profile, and the impossibility to help its education on all specific domains of LG and BE, a point of attention is the connection between ABEL and the Centres of Expertise in which BUAs participates. These centres provide a wealth of opportunities to discuss developments in the

domain with peers, and to feed each other with the specific expertise of other Universities of Applied Science and their networks on adjacent and other specific domains. These are steady networks that have proven their value. They can help ABEL to specialize on specific domains, and at the same time feeding education in a very broad sense.

ABEL feeds three websites to communicate its research results to a wider audience. In addition to the BUAs website, ABEL created a website several years ago to showcase its activities to inspire prospective students and their parents to choose for the academy. A related website was installed to communicate specifically with the industry and show the impact and 'way of working' of ABEL's research projects. The ABEL activities as a front-runner led to a renewal of the BUAs website (spring 2021) that will combine the possibilities of the above-mentioned websites.

### **Conclusion**

The organization and deployment of resources is impressive, with high levels of external funding and a flexible organization in deployment of staff on research and education. The committee is particularly impressed with the close connection between research and education – research being part of the range of tasks of many staff members. ABEL's participation in CoEs could even strengthen this connection. The ABEL management team seems to work effectively with an important role of the RBI manager. This asks for a high level of sensibility and mutual respect – which seems to be the case. The position of professors is a point of attention for maintaining continuity in the long term. Networks and collaborations are outstanding and clearly a strength of the academy. Although research projects clearly fit in the expertise areas of ABEL and the strategy of BUAs, more consideration could be given in the next phase to projects being in line with the strategy.

Based on above mentioned considerations the evaluation committee assesses standard 2 as **good**.

## Standard 3

*The research and the research unit fulfil the standards that apply within the discipline, with respect to conducting research.*

### **Explicit research standards**

ABEL's research agenda and research questions are defined in collaboration with industry partners, or with its potential impact on the industry in mind. The emphasis on knowledge valorisation to industry through dissemination and exploitation activities leads to several characteristics of its research. According to ABEL's critical reflection report – and confirmed by the committee – the research performed by ABEL often is interdisciplinary, formed in a wide range of governing structures, methodologically sound, strongly connected to education, conducted within networks and is diverse in terms of the type of research, way of publication, types of outputs and networks involved.

In 2018 the Netherlands Code of Conduct for Research Integrity was introduced for Dutch universities. Researchers should be aware of this code and adhere to the five basic principles regarding the behaviour of researchers: honesty, accuracy, transparency, independence, and responsibility. ABEL promotes an open working environment where research quality and integrity can be discussed. Although an informal evaluation confirms that ABEL adheres to the basic principles, the academy considers it important that a formalized structure is in place. The committee fully concurs with this statement.

In the past years, initiatives have been developed at BUAs level to work towards full compliance with the code of conduct, for example the formal adoption of the Complaints Regulation Model for Research Integrity (VSNU – Association of Universities in the Netherlands); a Research Integrity Confidential Advisor for BUAs was appointed and a legal advisor has been added as a secretary to the BUAs-wide Academic Integrity Committee. Currently the 'Research Data Management and Research Integrity project' is underway. With this project BUAs aims at establishing a clear and approved BUAs-wide legal and ethical research framework which will facilitate awareness of and compliance with the prevailing research integrity code.

Based on its virtual visit and the received documentation set, the committee gets the impression of an open and honest atmosphere with clear communication towards stakeholders and students. The systems to monitor research excellence in ethics and integrity are sound and sufficiently in place. Researchers (both junior and senior) seem to be aware of the code of conduct and of the GDPR (General Data Protection Regulations). The committee emphasizes the importance of a well-organized system for integrity and GDPR regulations and encourages ABEL and BUAs to keep developing the integrity and ethics system.

The committee met with an enthusiastic team of researcher-teachers, full of energy and operating based on a common vision on research. The development of learning communities (see standard 4) is building on a particular strength of ABEL, in which stakeholders and industry co-create or at least are involved in research. Although the committee met with enthusiastic players and enjoyed the discussions, it would have appreciated if learning points had been put forward and more explicitly shared and discussed, both in the Critical Reflection report, in the interviews and as standard part of the process at ABEL.

### **Research quality**

ABEL has developed a process flow chart in order to have all projects set up according to agreed process steps. ABEL indicates that each project is continuously monitored on its quality by the RBI manager, project leader and the central office for Project Planning and Control (PPC). The quality assurance system is aimed at preparation, execution, and evaluation of research projects, both financially and in terms of content. In the preparation phase the project must fulfil criteria to ensure that the research will be able to serve professional and social interests. The next step is the research design by the project leader. Although research questions might differ from one project to the other, all projects must aim at answering questions, challenges or problems that are relevant to the industry partners and the proposed methodologies have to meet the quality standards. The research and data handling steps that are used for the research design, are also used in the education programmes. The next phase, the execution phase, starts with a kick-off and is monitored by the PPC. At the end of this phase, a draft report is written and, if applicable, draft versions of products are presented. All products are developed by two or more researchers. In the Evaluation and dissemination phase there is an internal evaluation meeting and external partners are requested to fill out a standard digital questionnaire.

At BUAs level, every academy agrees on setting annual targets, based on (mostly quantitative) indicators that include academic output, output for education, output for industry/society and international collaboration. These indicators are registered in the online system PURE and monitored three times per year. Furthermore, review activities (including peer review) are important to assure the research process and quality of research output by the academy. The external peer review process takes place in the process of publishing of peer reviewed journal articles. According to the critical reflection, the internal peer review process is still in development. Also, the supervision process of researchers is being developed. A supervisor is always appointed to new research staff and in practical terms this works well. However, a standard introduction programme for juniors or new researchers is not yet in place. The professors have developed a quality assurance framework, built on the flow chart, that includes organizational matters, a meeting structure, and dedicated steps for quality assessment in specific research phases.

The committee is of the opinion that the system for quality assurance has been set up in a clear and systematic way, with a flow chart that assures the previously mentioned phases of research. The committee did not get a clear picture of the value of this flow chart in research practice. The working methods, project design and execution are considered, and projects are evaluated. The committee appreciates the development of the quality assurance framework which is expected to support embedding of the flow chart in daily practice. From the meeting with stakeholders, it became clear to the committee that the evaluation phase is not limited to a questionnaire. There is regular formal and informal contact with partners throughout the projects to steer and adapt if necessary. Although the committee understands that this system for quality assurance is an internal system, it is of the opinion that the involvement of and impact on stakeholders could be more strongly emphasized.

The impression of the committee is that ABEL's research output is of good quality. The committee would have appreciated to have been given the opportunity to judge this in more detail. The high quality is indicated by the products which have been presented to the committee, as well as by the open and honest way of discussing the quality of research results. According to researchers, the freedom and flexibility they are given, are at the root of great projects. Of course, it is

important to consider a project in the larger context of the academy. Potential research projects are developed in consultation with industry. Researchers discuss possible projects with stakeholders. They explicitly do not present themselves as a kind of consultants that will answer any question. The aim is to work together on long-term themes that are in-depth and strengthen the professional field and education. Internationally, ABEL is known for its research on (data-driven) cycling policy enhancement, with an expanding local, regional, national and international network.

ABEL's research output has increased in terms of quantity over the past years. The interrelation of figures in the tables as presented in the Critical Reflection Report was not made quite clear, however, the figures point to an impressive output, and form a sign that research within ABEL is maturing. Next to that, the committee emphasizes that quality of output still prevails over any quantity. Internal peer review is important in maintaining and even increasing the quality of the research. Several (academic) stakeholders that collaborate with ABEL in research projects confirmed the quality of the research and the explicit focus of ABEL researchers on quality. For example, it was stated that the research by ABEL is not inferior to an academic institute in methodology. Although the quality of the research as well as the quality assurance at project level indeed seems to be high, the committee sees opportunities to further develop this for the entire research programme. ABEL is taking steps in this direction and the committee stimulates the academy to take the next step in getting knowledge accumulation transcending the project level.

The committee is of the opinion that the process for monitoring and evaluation of research projects is detailed (see also standard 5). Appropriate standards for quality assurance are described (some are still in development) and regular meetings of professors and the RBI manager are important for joint monitoring. At the same time, the committee noticed that quality seems to result from the frequent interaction of all players involved in a project and builds on entrepreneurship rather than on strict methodological monitoring and adherence to the standards. This way of working suits ABEL's current research character and research staff. Nevertheless, the committee emphasizes the importance of guaranteeing the quality level in the future and independently from the research staff involved. This requires making (basic) ethics and integrity aspects more explicit – like ABEL's policy of creating trust and transparency about mutual expectations.

### **Research facilitation**

The BUAs library is considered a valuable and recognised partner in education and research for students, researchers, and lecturers. The library plays a central role in developing BUAs policy regarding data management and open access. Even though the committee was not able to go to Breda and view the facilities in person, based on the descriptions and demonstration it concludes that the facilities are good and of major importance for the research at ABEL.

### **Conclusion**

The committee believes the quality of the research to be good, maybe very good, particularly in the high priority expertise areas. Standards for high-quality research are in place and are discussed on a regular basis within the academy. There is evidence of varied research outputs across the range of different elements: academic and applied knowledge and the output and products related to creating impact for society and industry.

The committee has seen very sound research standards mainly as a result of frequent interaction between all players involved in a project rather than adhering to the standards set. The major criticism of the committee is that many aspects are rather implicit than explicit, and knowledge accumulation at programme level does not yet function optimally. By making the way of working more explicit and focusing on the long term, the latter could be achieved and would make the academy leader in the applied research approach.

Management as well as researchers are conscious regarding ethical and integrity issues, leading to validity of the research. This attention is also reflected in the education of students. By unification of the ethics and integrity on a strategic level with procedures that are similar throughout the academy further strengthening will become more visible.

Based on above mentioned considerations the evaluation committee assesses standard 3 as **good**.

## Standard 4

*The research unit realises sufficient relevance with respect to:*

- *professional practice and society;*
- *education and training;*
- *the knowledge development within the research domain.*

*The research has a sufficient degree of impact on the aforementioned sectors*

### **In general**

The academy aims at developing and sharing its knowledge and products in cooperation with education, industry and academia with innovation as an outcome. With this goal, ABEL adheres to the common goal for universities of applied sciences to perform research with impact. Every four months the research and project output are registered in PURE and achievements are reported to the Executive Board as part of the Management Report. In the past years, the output of research projects has increased and includes academic publications, conference papers and books. The output also includes project-related output and deliverables, professional and popular publications, and media appearances. Research output has increased since 2007-2008 and since 2016 an increase in English output has also been noted. Two expertise areas are dominant in providing research output, the highest priority areas that are led by the two professors.

The vision on research fits in well with a university of applied sciences; to contribute to ABEL's education and to innovation in professional practice. ABEL is doing exactly what this vision intends, and is stimulated by the committee to continue doing so. The cooperation with, and inclusion of both students and industry in research projects is impressive, and one of the major strengths of ABEL. The committee was pleased to notice quite a lot of interaction with industry. The committee would like to know to which extent we can speak of co-production and common learning. Although the character of this interaction and its degree of mutuality were not clear in full to the committee, it believes the research to have an impact on business practice and definitely on education. Impressive examples were given of students being involved in research projects with industry partners. Also, stakeholders and industry are actively involved in the set-up and design of the research (co-creation). The committee thinks that the concept of Learning Communities is an interesting development for ABEL's ambition that includes the triple helix of industry, research, and education. By creating infrastructure, facilitating and organizing the interaction, research projects will become joint ventures with contributions of stakeholders, students and research staff.

In the paragraphs below, the relevance of the research and its connection to the research domain, education and professional practice is elaborated upon. However, the committee commends the academy on the impressive and natural way it integrates these aspects in its daily functioning.

### **Knowledge development within the research domain**

ABEL focuses strongly on applied research for and with its industry partners. This leads to output that is mainly aimed at professional products rather than scholarly impact. Nevertheless, researchers publish occasionally in peer-reviewed journal articles and contribute to conferences. These outputs support the international representation of the researchers. In the critical reflection some good examples are given of projects that led to academic outputs. In the past years ABEL

has taken steps to make more distinction between projects in which knowledge is applied and research in which knowledge building is key. For example, students involved in research projects are increasingly using the results produced by previous students, which leads to knowledge build-up. The committee is positive about the (inter)national connections that professors have with academic universities. Although ABEL is not primarily focusing on academic research, it shows that the quality of the research is up to par with international academic standards. This is important regarding the international ambition of BUAs and ABEL. In the interview with researchers, the committee learned that they are working on ways to collaborate with academic universities without renouncing applied research and the strong connection with education.

### **The professional practice and society**

In research projects, ABEL is actively collaborating with industry on applied research outputs. Projects are usually the result of a long-term established (and increasingly internationally oriented) network in which BUAs is active. The results of this research lead to a variety in output, for example professional publications and media appearances. Between 2015 and 2019 'Meaningful meetings' have been organized with industry to showcase and share research projects. ABEL has cooperation roadmaps and project cooperation agreements with a large variety of stakeholders from industry, both regional, national, and international. Industry partners praise ABEL for the way it guides the research process from acquisition and funding to research design and execution.

A good example of collaborative projects between ABEL and the professional practice is DALI (Data Science for Logistic Innovation) in which 18 companies work on pilot studies using data applications to make processes in logistics and supply chains smarter. Another example that was mentioned in the Critical Reflection Report and in the interviews, is LOWI the Delivery Robot. This electrical and autonomous delivery robot was introduced by ABEL on the BUAs campus as an example of the last-mile solution. An international example is METAMORPHOSIS, an EU-funded project focused on the transformation of neighbourhoods with a focus on children in cities across Europe.

The work of ABEL indeed seems to have substantial impact on the professional practice. From the meeting with external stakeholders, the committee concludes that in most projects collaboration started from a regional perspective. Nevertheless, once the collaboration is in place, there is strong appreciation for the focus on both quality research in combination with relevance to industry. In particular, the flexibility of ABEL to deal with challenges and questions in a customized manner, was mentioned as a strength. The committee would like to specifically mention the collaboration with LCB. In this initiative ABEL joins forces with academic partners in Brabant through LCB companies. Given ABEL's emphasis on mid- to long-term goals and programming, the cooperation with LCB and the two Centres of Expertise in which ABEL participates, is more important than ever. Both ABEL and LCB explicitly mention the benefits of cooperation. The committee has the impression that ABEL does not fully make use of the opportunities of collaboration with CoEs, or comparable centres, and recommends to explore its opportunities further as it is not only in favour of ABEL's education and the innovation of the professional practice, but also stimulates the depth of ABEL's research.

Stakeholders indicated that, after the previous audit, ABEL started to work more based on its own research agenda and was less influenced by the needs of industry. It is striking that the



stakeholders indicated that ABEL should continue in this way, whereby education in LG and BE (and crossovers) in combination with the requirements of the professional practice determine the agenda and provide focus. The committee is of the opinion that focus in the research agenda will make clear to stakeholders where ABEL's expertise lies and whether ABEL is the right partner for collaboration.

The reviewed documents as well as the interviews the committee held, all point to ABEL's research to have impact of on practice and society. BUAs and the academy have deserved a special position in professional practice, based on their own research capabilities, vision and attitude – not being an academic university on the one hand, nor a consultant on the other. This is an impressive result and could be advertised even more. A strength of the academy is the strong applicability of the research in the market. The flexibility within the research methods makes it possible to adapt to market demands quickly.

### **Education and professional training**

Both research and education are integral parts of all activities at the academy, to ensure maximum synergy across the entire organization. Professors dedicate part of their time to educational activities and there are no full-time researchers, meaning that all researchers are involved in education. On average, researchers contribute about 25% of their time to education. Another topic that is regarded an important aspect of the impact of research is the professional development of lecturers. Lecturers are offered the opportunity to be involved in external projects and/or conduct research as a form of professional development. An increasing number of lecturers are interested in doing so, it provides them with a challenge and allows them to excel in their area of expertise.

Educational tasks of research staff consist of providing research education, supervision of placement, or commissioning graduation assignments. Researchers, furthermore, contribute to educational innovation in the educational CLiP project, in which the LG and BE curricula are innovated. In return, ABEL lecturers are encouraged to contribute to research and do so in practice, but not for a large number of hours – the total adds up to around 2,000 hours annually. It is also common practice for students to participate in research projects, for example direct involvement in research projects for their graduation project. Also, short traineeships and free electives can be part of the students' education. Students are stimulated to take part in hackathons, learning communities in which an actual set of challenges, real client, and a sense of competition among groups of participants with complementary backgrounds and skills are combined. Students show a steep learning curve when they study real-life environment. At ABEL, the involvement of student in real-life projects is called 'FreshBrains', and approximately 100-150 students participate in these projects each year. A successful example of 'FreshBrains' is the European CIVITAS ELEVATE project. The new curricula of educational programmes starting in 2021 explicitly enable more community learning activities. The committee considers this a very promising step for the future.

The committee identifies a strong interconnection of research with the curriculum at an outstanding level with strong interlinks between research and education. An excellent example of this is the 'FreshBrains', but all highlights in this field in the critical reflection were interesting. Students displayed critical thinking and research skills, showing that the methodological approach of BUAs is clearly embedded in its education. The committee strongly appreciates that

researchers are being involved in education and lecturers participate in research. This ensures that the research has a substantial impact on education (and on the professional practice). Students being involved in the research of 'real life' research questions and challenges provides them with valuable experience and skills. Their enthusiasm and fresh perspective on challenges make it possible that businesses and industry may well benefit from the connection between education and research at ABEL.

Students also seem to appreciate their involvement in research projects. They told the committee that they highly appreciate the flexibility and project-based curriculum. ABEL found a promising way for flexible cooperation with education. The committee points out the importance to continue serving students with all basic knowledge that is required for their education and the basic skills they need after graduating to be able to work as, for example, a civil servant on mobility plans in cities. This was also a critical remark from industry partners, though at the same time ABEL was praised for their high-quality output and commitment to their research and projects.

### **Conclusion**

The close interaction between research, education and industry is clearly a major strength of ABEL, which is further strengthened by the development of learning communities. The projects showcased in the critical reflection are impressive. All research is performed in many different projects that clearly include a stakeholder perspective. Also, stakeholders are very pleased with the work of ABEL. Students are positive about their involvement in research projects, it helps them to develop into well-trained, responsible graduates. The committee does point out the importance of theoretical knowledge in the educational programmes that should be maintained or even addressed more explicitly. The committee understood from the industry and academic and research partners that ABEL delivers high-quality work. Both industry and society clearly appreciate the 'Fresh Brains' concept while maintaining this high-quality output.

Based on above mentioned considerations the evaluation committee assesses standard 4 as **excellent**.

## Standard 5

*The research unit conducts regular and systematic evaluations of the research processes and results. The research unit then, where necessary, connects the results to improvements.*

### Quality assurance system

BUAs' organizational structure is based on decentralisation, though clearly with central control. The culture of involvement and ownership in all tiers of the organization is the foundation of the quality assurance system. The quality assurance system for research is described in the 'Quality agreement for research'. An important part of the quality assurance system at institutional level is the Planning & Control cycle (P&C cycle), the central steering mechanism of the Executive Board and academy directors, giving systematic direction to the planning and control of the organization.

At research unit level, quality assurance is designed along the line of a six-yearly external quality assurance cycle, of which the current audit is a marking point. In between, BUAs organizes an internal mid-term review. A BUAs-wide project on improving the collection of management data will start in 2021. The expectation is that this project will improve the collection and interpretation of monitoring data, and to ensure sufficient reliability and validity of these data.

Researchers discuss their annual goals with their (RBI) manager on an individual basis. At the end of the year, an assessment interview is held to monitor and discuss progress on targets and ambitions agreed. If needed, adjustments are made. Communication lines are short, and hierarchy is limited. In close consultation between the RBI manager, staff member and/or RBI team issues are addressed and dealt with. The committee appreciates the fact that tailor-made goals and objectives are optional for all researchers. The next step would be to plan proactively and define annual goals for staff for the KPIs to be developed and discuss them in the annual performance reviews.

Researchers are encouraged to bring in or develop ideas for new research projects. Once a project is awarded, a kick-off meeting is organized with the project leader, RBI manager and a PPC officer. In case of involvement of external parties, a second kick-off meeting is organized to manage expectations. Large projects require an interim report, for other projects the development is discussed in planned and unplanned bilateral meetings between the staff involved and RBI manager. Communication and valorisation are explicitly the responsibility of the project leader, Finally, evaluation is standard at the completion of a project.

From the interview and documentation, the committee concludes that there is a system in place for evaluating and monitoring the success in relation to the performance, workload planning and registration of output (PURE). The committee is positive about the fact that ABEL seems to regularly evaluate its work with partners, but it did not get a good insight in how this works in professional practice. The presented Satisfaction Reports were lacking substantial evidence to support its evaluation. ABEL operates based on many mutual and bilateral contacts, which is a good starting point for continuous evaluations. The committee stimulates ABEL to aim slightly higher, searching for continuous improvement. Formalizing the quality criteria, introduction of applicable KPIs will help to ensure high quality and a targeted approach to research activities and impact.

## **Conclusion**

BUAs and the academy keep track of the progress and quality and relevant evaluations are taking place. The committee considers that there is a system (PURE) in place that can be used in a strategic manner at academy level. By redefining clear KPIs at academy level the system of evaluating and planning can be improved and will become more transparent to all staff.

Based on above mentioned considerations the evaluation committee assesses standard 5 as **satisfactory**.

### 3. Conclusive judgements

#### Assessments on the standards

The evaluation committee comes to the following judgements with regard to the standards.

Standard	Assessment
<i>Standard 1 Research profile and research programme</i>	<b>satisfactory</b>
<i>Standard 2 Preconditions</i>	<b>good</b>
<i>Standard 3 (Methodical) quality of the research</i>	<b>good</b>
<i>Standard 4 Results and impact</i>	<b>excellent</b>
<i>Standard 5 Quality assurance</i>	<b>satisfactory</b>

The committee met with an enthusiastic team of researcher-teachers, full of energy and operating on the basis of a well-funded and adequate vision on research: contributing to ABEL's education and innovation in professional practice. Lines are short and research is well embedded and integrated in ABEL, BUAs and the professional practice. The committee stimulates ABEL to continue this way of working. The development of learning communities is an interesting and promising addition to the already strong interaction between research, education and industry. Development of a new set of KPIs, based on issues such as the rate of interaction, co-production and common learning, will help ABEL to clearly show the impact of its research.

ABEL is able to attract good researchers who play a role in the education of good students, build up large networks and attract large amounts of funding. This deserves a compliment. The entrepreneurship is valuable, but makes the organization also vulnerable in case of departure of staff members. This vulnerability is reinforced by the fact that professors are appointed for a limited number of years. The committee sees opportunities for ABEL to not only have high quality research projects, but to also create synergy at programming level.

The flexible approach in operating towards education and professional practice is a great asset, but makes ABEL vulnerable for achieving the long-term goals and vision. Alignment of ABEL's research agenda with that of other academies is supported by the committee and results in some interesting, interdisciplinary projects. Although currently somewhat limited, there are opportunities for increased synergy between the two main fields: logistics and built environment. The committee recommends focusing on finding synergy and creating connection between the two fields (BE and LG) without it lowering the high-quality research and impact on education and innovation in professional practice.

Standard 1 and 5 are assessed with the judgement 'Satisfactory'. The standards 2 and 3 are assessed with the judgement 'Good' and standard 4 receives the judgement 'Excellent'. Overall, the evaluation committee assesses the quality of the research unit ABEL of BUAs University of Applied Sciences as good.

## 4. Recommendations

The evaluation committee has the following recommendations for the research group:

- Operating as a Learning Community is challenging, also for this review. The committee recommends to be more open in this process. The review committee enjoyed the enthusiasm of all players involved, but the focus could have been more on learning points, both in the Critical Reflection Report and in the discussions during the virtual visit.
- Given the restricted emphasis that is put on programming and long term goals, cooperation with LCB and the two Centres of Expertise in which RBI participates, is more important than ever. The committee recommends to extend this collaboration, in favour of ABEL's education, the innovation of professional practice, but also in favour of the profoundness of RBI's research.
- Working with KPIs is fine, but the current KPIs are too general and do not seem to help RBI in assuring to reach its goals. The committee recommends to develop a new system of monitoring its impact, much more based on the rate of interaction and common learning.
- The committee recommends to extend the professorships, in number or FTEs, and in length of terms.

## 5. Appendices

## Appendix 1 Documents Examined

The evaluation committee had access to the following documents:

### General

- Critical Reflection Report
- Appendices:
  - o Appendix 1: Creating Professional Value, Strategy 2018-2021 BUAs and Strategy Map
  - o Appendix 2: Academy Plan Built Environment and Logistics (ABEL)
  - o Appendix 3: ABEL RBI Midterm Self Reflection Report (2019, in Dutch)
  - o Appendix 4: Workflow secondary and tertiary funding sources
  - o Appendix 5: Stakeholder Satisfaction Survey Results 2020
  - o Appendix 6: Way of work to improve quality of research ABEL, 2020
  - o Appendix 7: Project and Prospect Overview PPC (not fully exhaustive, but since introduction PPC)
  - o Appendix 8: Overview of external presentations and press coverage



## Appendix 2 Programme of the Site Visit

Time	Activity	Present
9.00 – 10.00	Meet the Board and Management (NL)	Chair of the Executive Board Academy Director ABEL RBI manager Education Manager LG
10.00-10.15	Short break	
10.15-11.15	Meet the Professors and Senior Researchers (EN)	Professor Urban Intelligence Professor Smart Cities & Logistics Senior Researcher Senior Business Developer Senior Researcher
11.15-11.30	Short break	
11.30-12.30	Lecturers and researchers (NL)	Senior Lecturer & Researcher Senior Lecturer & Researcher Lecturer & Researcher Lecturer & Researcher Lecturer & Researcher Project Planning & Control
12.30-13.30	Lunch break	
13.30-14.30	Students participating in research or benefitting from research (EN)	former student BE and junior researcher former student LG and junior researcher former student BE and junior researcher student BE student LG
14.30-14.45	Short break	
14.45-15.45	External research partners (EN)	Provincie Noord-Brabant Cambridge University Logistics Community Brabant DTV Consultants Collect & Go
15.45-16.45	Panel meeting, preparing feedback results	NQA panel
16.45-17.15	Feedback results and closing of the day (EN)	NQA panel + All contributors to the sessions

### Appendix 3 Expertise Committee Members and Secretary

Drs. S.J.C.M. Weijers, emeritus professor in Logistics and Alliances at HAN University of Applied Sciences (chair), the Netherlands
Mrs. drs. E. (Elke) Bossaert, committee member and expert in mobility management and strategic planning as Strategic Accessibility Manager at Brussels Airport Company.
Mrs. drs. M. (Maud) Hensen, committee member and expert in the domain of Built Environment as Team manager Sustainable Built Environment at Hogeschool Zuyd.
Mrs. dr. van Bogaert, auditor NQA