

Research Assessment Exercise 2020 - Impact Case Study

University: The University of Hong Kong (HKU)

Unit of Assessment (UoA): 17 – Architecture

Title of case study: BIG HEAVY BEAUTIFUL (BHB): reimagining a new Parisian *quartier* for the benefit of people, places and organisations.

(1) Summary of the impact

The ‘Big, Heavy, Beautiful’ (BHB) development in Paris, undertaken between 2007 and 2018, is an innovation in designing and building an urban *quartier*. It has created a complete micro living quarter on the site of, and including, an existing bus terminus and garage. Professor Seraji’s project introduces to the fabric of this tirelessly innovative city something that has not been tried before: a careful but playful arrangement of work, services, living, education, recreation and greening through *innovative engineering of physical levels, access, function integration and separation, landownership and management*. Packed into a 100-year-old bus station that serves the 14th Arrondissement of Central Paris is what has been described as Professor Seraji’s ‘ground-scraper’. BHB is a horizontal skyscraper compacted into 2.1 hectares (bigger than three soccer fields) with single entry-egress onto a narrow, historic Paris street. The project secured a €145 million investment from the Paris Municipal Transport Authority on behalf of four sets of stakeholders: **(i)** regional and local governments of *Greater Paris*, the *Paris City Hall* and the *Paris Transport Authority*; **(ii)** multiple direct user *communities* including bus drivers, residents and pre-schoolers and their parents; **(iii)** the *general public, neighbourhood residents and businesses*; and **(iv)** *architects* involved in similar complex projects. The rigorous analysis and argumentation underpinning the planning, design and implementation of this project have led to direct, positive impacts on thousands of residents and visitors, the urban environment of an historical quarter of Paris, and on the approaches by other architects and professionals to city regeneration opportunities.

(2) Underpinning research

The project demanded research into **five domains** crucial to large-scale architecture in this historic and cultural city. **(i) Historical** investigations included desk research into all published projects by the Regional Authority for Passenger Transport (RAPT) since 1949; the historical relationships between densification of the city and transport systems since the 19th century; and a specific investigation into the work of Eugene Hénard, the engineer-architect who influenced the Moderns, notably Le Corbusier, through his study of the contemporary city [a]. **(ii) Structural** investigations of two substantial refined hollow structural systems. Specialty studies for this project were required so that the bus depot and maintenance areas could be built on an unusually large grid of 15m X 15m, a design-research challenge economically and structurally since social housing (which in BHB sits on top of the bus depot) is more optimally designed on a grid of 6m intervals. The structural research led Professor Seraji’s team to the study of waffle/hollow structures that would also act as a large span roof and support the 7,500 m² of common vegetable garden for the inhabitants. A transfer slab was not logical for reasons of economy and because its weight, when added to that of the topsoil needed for gardening, would have been too great. An innovative solution was required, tailoring every beam exactly to the point loads required and hence requiring a variable geometry allowing for the minimum use of material [b]. **(iii) Materials** investigations into a) specific vegetation types that demand low amounts of topsoil and minimum or no watering and yield maximum biodiversity to create a microclimate in the 7,500 m² agro-garden area on the roof; and b) ways of hanging large ceramic tiles to reflect the sun and using other locally sourced and climatically-functioning materials (all fabricated in one-to-one scale for testing on site). **(iv) Typological** investigations into collective and social housing in Europe between 1906 and 2007 to identify precedents for the team’s design options [c]. **(v) Sociological** research into the study of neighbourhood needs and the design of a post-occupancy survey to inform future projects involving complex sites. The framing of (a-e) above, came from Professor Seraji’s long-standing professional and academic expertise in housing interventions in Paris

and other the European cities, captured in [a], an exhibition and a book on a hundred years of innovative collective housing that inspired the Paris project.

These research activities yielded answers to the following six underlying research questions embedded in this nationally significant architectural project. **(i)** How to densify the centre of an already dense, historically sensitive city through programmatic superimposition without resorting to excessive heights (challenging the Asian and European suburban high-rise model). **(ii)** How to superimpose ownership (sectional) when traditionally in European cities landownership involves planar division. **(iii)** How to design a “self-managed” common space for the use of inhabitants to help create a sense of belonging and shared interests. **(iv)** How to use the size of the building (30,000 m²) in the wider city context to create urbanity and connections that link the site with the neighbourhood rather than alienating it. **(v)** How to design a new urban typology (horizontal density and 30,000m² of urban substance) for the RAPT that gives sufficient social and capital return on investment through building upon existing heritage, and creates a sense of belonging and retains and enhances use-value for multiple stakeholder groups. **(vi)** How to design a new, high-density urban *quartier* that keeps the operating bus station and avoids selling the land and moving out to the suburbs.

Addressing these questions required the development of a research-based design methodology including: Drawings as language, intentions and descriptions; 3-D physical and digital models; BIM (Building Information Modelling) models (BHB became one of the first complex housing projects to use BIM in Paris); Public consultation and debates using oral presentations with the support of 3-D physical and digital model, blackboard illustrations and graphic novels; A post-occupancy research framework.

(3) References to the research

[a] Seraji, N. (2007) ‘Logement, matière de nos villes / Housing, *Substance of our Cities*’ (bilingual), Paris: Édition Picard. [ISBN: 9782708407954]

[b] Blaisse, L. and Richard S. (2013) ‘Trois Architectes, une parcelle de Paris = Three Architects, a Parisian plot’. Paris: AAM Editions – Archives d’architecture Modern. [ISBN-13: 978-2871432678]

[c] Seraji, N. (2019) ‘Big Heavy Beautiful 2017’, RAE 2020, pp. 14-15, 28-29.

[d] Scoffier, R. (2018) ‘Rénovation du centre bus de la porte d’Orléans, Paris’ d’Architecture, 3 May 2018, pp. 98-113.

[e] Seraji, N. (2009) “Dazibao D’architectures” - a solo exhibition of a synthesis of ten years of research in unbuilt and to be built architectural projects of Atelier Seraji Architectes et Associés (ASAA) La Galerie d’Architecture. Location: Paris

(4) Details of the impact

(4.a) Impact of the competition entry. For the first time in its history, in 2007 RAPT launched an international competition to redevelop one of its major sites in Paris for social, private and student housing and for renovating and restructuring an existing bus depot. The vision, a first for Paris, would be a mix of “*living and mobility*”. Professor Seraji’s office and her team of engineers were the winners of this competition. **Seraji’s competition research and design led to the funders, landowner and organised vested interests such as trades unions embracing her ideas about how to solve this complex set of problems and requirements. It has had impacts on attitudes and policies concerning all RAPT projects since.**

(4.b) Impact of completing a built project. Public projects of a certain scale are complex in a particular way, as there are many stakeholders acting on behalf of their institutions and engaging large sums of money (mainly taxes) in the public interest. During the ten-year life of this project, from inception, competition, construction and completion to occupation and **its status as a French national project of “public interest”**, it has involved a great number of public actors, audiences and users. This project therefore has had a major impact on how the Paris transport authority, the public, developers, landowners, users and architects now view the possibilities of building a residential

quarter integrated into a functioning industrial site. The project and its impact have been widely publicised and discussed [4, 5, 6]

(4.c) Impact on the client's overview on landholdings. RATP owns many bus depots housing the vehicles that serve *intramuros* Paris and meaning that a large area of very expensive real estate in inner Paris is serving as storage and maintenance areas. Keeping these city centre facilities is essential to the efficiency of public transport for Parisians in terms of travel time and costs but this has not hitherto been possible. As a result of **HKU Seraji's innovative solution, RATP is reappraising its plans for other similar outmoded facilities.**

(4.d) Impact on the Parisian architectural and development industry and the broader public. The competition and the final choice of the winners induced architects and their consultants to think about the role of the architect in large-scale projects. More than 140 teams applied and, based on their early sketch designs, ten were auditioned. Each team was interviewed on television to describe why it was important to leave this major transport infrastructure node in the heart of Paris and not move it to the suburbs. The project became a model for future sites with the same locational challenges. Ten lectures, symposia and debates were organised by Seraji to inform the public about the impact that the project would have on their everyday lives. BHB has been viewed at the Arsenal Pavilion (a permanent exhibition for architecture and urbanism) in Paris by thousands of local and International visitors.

(4.e) Impact on trades unions negotiations and transport workers' rights to better workspace. Negotiations with the trades unions took place by monthly meetings that enabled dialogue between the technical experts, drivers' union representatives, and Seraji's team. This process, over three years, enabled the users to appropriate the design and become partial authors, leading to a breakthrough in the collective sense of belonging and ownership of this high-profile civic architectural project. The collaborative design process kept the powerful union on board and presents a model for other such schemes. All new RATP sites involving the same complex programmes are adopting similar consultative design approaches.

(4.f) Impact on the attitudes of the authorities, potential funders and the general public. A big civic architectural project like this has impact at many stages. Immediately after the competition was won, presentations were made to the Greater Paris region council and potential funding bodies (City Hall of Paris, the historical and heritage board and the neighbourhood associations). The importance of this stage was to make a strong initial impact on key stakeholder groups, especially potential funders, in a way that would smooth the way for more detailed design negotiations. Seraji's team's role was to synthesise and attempt to harmonise opposing demands through the recursive adjustment of its design model. At every stage Seraji produced 20 copies of books detailing the project in three volumes: design, sustainability (social, climatic) and cost. All documentation and minutes of these meetings were available for consultation at the Paris City Hall archives between November 2015 and November 2017. Achieving immediate and widespread positive impact on stakeholders at this stage was crucial to the project's subsequent success. The unequivocal evidence for this kind of impact is the fact that the project moved smoothly to the next phase and went on to be successfully constructed and occupied. Some 350 members of the public consulted the documents at the Archives of City of Paris.

(4.g) Post-occupancy evaluation. As an academic practicing architect, Professor Seraji is interested in systematically studying the effects of her work once built. The team cannot at this stage, present the results of the post-occupancy evaluation (POE) survey as evidence of impact on residents and other users, but the commissioning of a scientifically well-founded panel POE survey, at the request of the architect, is sure to make an impact on the way such things should be done. The bus depot has been occupied since November 2017 and the social housing was fully occupied in January 2018. At Professor Seraji's request, the housing association (Logis Transport, now RATP HABITAT) launched the POE survey (in November 2018) and required the architect (Seraji) to be present at meetings with the users every trimester thereafter. An annual survey is in progress and the results are published in

the 4th quarter of 2019. The post-occupancy survey involves an international team comprising the architect (Nasrin Seraji), a sociologist, a post-doctoral researcher on POE, a psychologist in social housing and the relationship of dense cities to habitation and health, a member of the local government, a researcher specialising in mobility in dense cities, an illustrator (capturing and drawing a visual novel of the procedures), and a photographer recording all interviews and conditions of living.

(4.h) Impact in relation to value and user numbers. The project reshaped a significant area of central Paris (2.1 hectares). It creates a new iconic piece of the Paris patchwork that can easily be identified from space. Its total cost was €145 million (€48 million bus depot, €97 million housing). In economic analysis, benefit is measured by price (price bid is the value of other resources the bidder is willing to give up in order to gain what is being purchased). The economic and social impact of this project can be objectively estimated at €145million, which can be viewed as RATP's estimated net present value of a stream of future social benefits. It can be claimed as an immediate impact since the Authority has already sunk this investment in Professor Seraji's design. €145million of social value comes from the innovative way in which Seraji's design delivers **191 fully occupied** social housing units; **106** private housing units; **365** student housing units; accommodation for a total of approximately **1,000 inhabitants**; maintenance and terminus accommodation for **148** buses (it is Paris's first hybrid bus depot) serving **8** lines; **700** new jobs; **7,500 m²** of green agro-roof, self-managed through a neighbourhood association; **1,500 m²** of playground for children living in the housing; a **99-bed/place** kindergarten with its own indoor pool and two outdoor playgrounds; and a green wall encyclopaedia for the children to understand varieties of plants. All these impacts have been delivered.

(5) Sources to corroborate the impact

- [1] Loin Des Machines, 'Rencontres Jourdan 2 / Meeting the inhabitants', Filmed 2018 at Boulevard Jourdan, Paris 14e, France, Video, 3:35, 2018. [<https://bit.ly/2mnxJIF>] (YouTube film of an annual meeting of the neighbourhood and the inhabitants as well as the housing association).
- [2] Moutarde, Nathalie, 'Un dépôt de bus parisien cède la place à un nouveau quartier mixte' *Le Moniteur*, 20 February 2015.
- [3] Paquier, Jacques, 'Ateliers Vaugirard : la RATP réinvente 2,3 ha au cœur du 15e' *Le journal du Grand Paris*, 20 February 2019.
- [4] Chabas, Sebastien, 'Le nouveau visage des Ateliers Jourdan-Corentin-Issoire à Paris' *Batiactu*, 17 November 2017.
- [5] Albert, Laurence, 'Aux Ateliers Jourdan, la RATP fait cohabiter industrie et logement' *Les Echos*, January 10 2018.
- [6] 'Pour la RATP, transports en commun pour trois agences parisiennes' *Chroniques d'architecture*, 28 November 2017.
- [7] Moutarde, Nathalie and Adrien Pouthier, 'Les Ateliers Jourdan-Corentin-Issoire sont sortis de terre' *Le Moniteur*, 13 January 2017.
- [8] Moutarde, Nathalie, '«Les Ateliers Jourdan-Corentin-Issoire» à Paris XIVE' *Le Moniteur*, 17 November 2017.
- [9] Monier-Vinard, Bruno, 'Archi - Paris 14e, un "immeuble ville" *Le Point*', 18 February 2017.
- [10] Paquier, Jacques, 'Ateliers Jourdan-Corentin-Issoire : la RATP construit un nouveau centre de bus et 650 logements' *Le journal du Grand Paris*, 19 February 2015.