**The Capital Project Planning Exercise: Instructor’s Guide**

The planning exercise consists of a lab-based simulation of the ‘fuzzy’ planning process for a real-world project, the redevelopment of Network Rail (NR)’s Salford Crescent Railway Station. The exercise is designed to be undertaken with graduate-standing students enrolled in engineering and management programmes (MSc./MBA) and in advanced executive education programmes. Its aim is to make students aware of the multi-stakeholder nature of the planning process for a new infrastructure development (capital) project. The exercise creates an opportunity for students/delegates to experience a major challenge invariably facing multi-stakeholder teams at the capital project onset: reach a multilateral agreement on a design concept that can cope with foreseeable evolution in design requirements over the project delivery and operating live. To hammer out a deal, the stakeholders must collectively balance affordability constraints with capital investments needed to ‘future-proof’ the asset, i.e., investments to design in provisions to build flexibility in the asset definition. Getting this balance right is not straightforward for a number of reasons. First, different stakeholders have different priorities, capabilities, and planning horizons; second, planning talks are inexorably intertwined with negotiations on how to distribute the costs of the capital investments; and third, some stakeholders may not be in a position to contribute to fund a concept that meets their needs, but they may nonetheless find themselves legitimately entitled to make particular demands in regards to design flexibility.

To play the exercise, the instructor needs to assemble teams of six participants, each one randomly assigned to play the role of a different stakeholder (see roles in Table 1). A week before the exercise, each student receives a set of instructions on how to play the allocated role including a generic design brief, a bespoken brief with information about their particular role, and ancillary information about the parent organization (Network Rail, University of Salford, Redevelopment Agency, Private Train Operator). Each team is then tasked to meet for a class session (~2 ½ hours) to discuss the pros and cons of a set of alternative concepts for the project and agree a design concept and funding strategy. In the following session the instructor and students can debrief the experience, debate the extent to which the exercise reasonably simulates a real-world capital project planning process, and discuss any lessons relevant to multi-stakeholder teams facing the challenge of balancing short-term affordability with long-term adaptability.

Table 1 – Project Stakeholder roles

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| **Role** | **Main objectives for project planning** | **Ancillary**  **information** |
| NR Project Manager | 1. deliver the project on time and within the budget;  2. ensure concept meets the DfT High Level Output Specification  3. ensure concept fits with the National Stations Improvement Programme (NISP) policy | NR Route Utilisation Strategy for the North West |
| NR Project Engineer | 1. ensure concept meets the technical standards and regulations  2. ensure concept enables to deliver to budget and within the timescale | NR Route Utilisation Strategy for the North West |
| NR Commercial Sponsor | ensure concept meets the external stakeholders’ interests, particularly those of the franchised station operator without compromising the NR commercial interests | NR Route Utilisation Strategy for the North West |
| University | 1.ensure the concept is aligned with the university’s master plan  2. ensure the concept guarantees ease of access to the campus  3.ensure the concept encourages people to commute sustainably | University Campus master plan |
| Regeneration agency | ensure the concept produces an aesthetically pleasant station building (‘landmark building’) to support the local socio-economic development | Vision and Regeneration Local Framework |
| Station operator | ensure that the concept guarantees short-term revenue protection, whilst improving the reliability and friendliness of the train services and station | Station operator response to the NR North West RUS |

Importantly, to enrich the quality of the debriefing session and to better the learning experience, the instructor can set up two types of teams. Teams in the control group have to get their act together without receiving any additional form of institutional support beyond the archival documents they will get prior to the meeting – this by and large mimics the way planning processes tend to occur in the real-world. In contrast, teams in the experimental group can be aided by a *Champion of Design for Evolvability*. The student allocated to this role will be handed over a bespoken design brief with detailed instructions. Broadly, the role of the champion is to educate the team about the implications of ruling in and out provisions to build in options, highlighting that doing something relatively small now – provided the investment is affordable and sensible – may prevent much trouble later. The brief itself offers a design for evolvability protocol that teams can adopt, which formalises the use of options logic to resolve concept design at planning. This protocol spells out a structured process to help the team decide, first, which provisions to cope with foreseeable uncertainties should be designed in the concept of a new asset with a long operational life, and second, how to distribute the capital costs. The Champion of Design for Evolvability is empowered to steer the multi-stakeholder team through the process that involves three stages, allowing for iterative loops.