Recommendation Paper: Including portfolio management practices into NIST Guide and RKB

Submitted on Behalf of Data, Metrics, and Tools Standing Committee to NIST and CRPCC

1. Introduction

Communities have significant challenges to address with limited funds. Therefore, one of the most challenging aspects for any community relates to developing the optimum portfolio of investments in support of strategic objectives within the constraints of the available budget. The *Community Resilience Economic Decision Guide for Buildings and Infrastructure Systems* ("the Economic Guide"), developed by the National Institute of Standards and Technology (NIST), includes key information for performing benefit-cost analysis for individual investments. However, as the Economic Guide itself indicates, more work is required to help communities develop comprehensive investment strategies:

> "NIST has proposed to expand the current suite of building economics standards to insure that systems concepts are rigorously addressed. These new standards, once developed, will enable decision makers to compare and contrast alternative community resilience investment strategies in a consistent and repeatable manner"… "By developing a user-friendly decision-support software tool in collaboration with key industry/community stakeholders, NIST will ensure that all required data elements—both benefits and costs—are properly accounted for and that the uncertainty associated with key assumptions and data elements is rigorously analyzed. The software tool will include a reporting feature that will summarize the results, highlighting assumptions used in performing the analysis and documenting the sensitivity of the results to those assumptions and other data elements.".[1]

2. Discussion

The Data, Metrics and Tools committee recommends additional efforts in this regard. We recommend that NIST, or a NIST funded entity, also expand material in the Guide to address key process issues associated with developing and managing a portfolio of investments in support of resiliency objectives. We also recommend that additional standards be outlined in support of the decision-making process, to include tools that assist communities in dealing with non-economic factors, such as tools used in multi-attribute decision making.

We suggest investigating and adding information, methods and tools on portfolio management (the process of managing a group of investments)[2], including at least:

- Developing investment objectives and establishing their relative weightings for a coordinated set of investments[3] and the set of hazards and threats to be considered

[1] Gilbert, Stanley W., et al., *Community Resilience Economic Decision Guide for Buildings and Infrastructure Systems*, NIST Special Publication 1197, December 2015, p. 31, *available at* http://dx.doi.org/10.6028 /NIST.SP.1197.
[2] Project Management Institute, *The Standard for Portfolio Management*, 3rd ed. (Newtown Square, PA: Project Management Institute, 2013),
[3] We adapted the material in this subsection from Michael Bible and Susan Bivins, *Mastering Project Portfolio Management* (J.Ross Publishing, 2011).

- Conducting risk/resilience analysis of a common set of threats and hazards on all participating systems and buildings in a consistent, comparable manner; analyzing risks due to interdependencies
- Deciding which risks can be tolerated, which transferred (e.g., buying insurance), and which to develop alternatives for
- Generating alternatives that reduce risks, enhance resilience and/or advance other investment objectives
- Valuing the alternatives relative to the extent they advance the objectives over their useful lifetimes (benefits). This value can be via economic measures or other methods, such as utility; estimate life-cycle costs and initial budget requirements
- Estimate uncertainties in the estimates of benefits and costs
- Ranking investment opportunities by net benefits (all objectives), considering the constraints of available budget and supplemental sources of funds; formulate tentative portfolio
- Reviewing the alternatives for synergies and double-counting in the context of a portfolio, adjusting the tentative portfolio accordingly
- Assessing portfolio risks (in terms of the ability to achieve the strategic objectives of the portfolio and the performance of the investments)
- Synthesizing results into forms suitable for decision-makers
- Selecting projects for the final portfolio based on net benefits (relative to all objectives) within the constraints of the budget
- Implementing, monitoring and controlling investment performance
- Evaluating systematically the extent to which the implemented projects have actually advanced the objectives by which they were justified and taking appropriate actions, such as continuing the project, modifying the project or terminating the project
- Establishing roles and responsibilities of executive-level, management-level, and staff-level teams in support of managing the portfolio of investments
- Establishing roles for key stakeholders in the project and portfolio management process and decision making, such as roles for infrastructure and buildings owners and managers, public utilities, private providers of services and infrastructure, , local governments and civil society.

3. Summary

Allocating resources and actively managing the portfolio of investments in support of the strategic objectives for resiliency will be an ongoing challenge for most communities. Communities would benefit from understanding methods to develop consensus around investment decisions, as well as structured processes for defining and managing their portfolio of investments in support of investment objectives.