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Standard Guide for Summarizing the Economic Impacts of Building-Related Projects¹

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^{ε1} NOTE—Adjunct title and stock number in 2.2 were updated editorially in April 2020.

INTRODUCTION

Quantitative descriptions of economic impacts are a basic requirement in many organizations for evaluating budget requests and the value of a project to the organization. Several measures of economic performance are available for evaluating building-related investments. These measures include, but are not limited to, life-cycle cost, the benefit-to-cost ratio, adjusted internal rate of return, and net benefits. This guide provides a generic format for presenting these economic measures of building-related investments.

1. Scope

1.1 This guide covers a generic format for summarizing the economic impacts of building-related projects.

1.2 The guide provides technical persons, analysts, and researchers a tool for communicating project impacts in a condensed format to management and non-technical persons.

1.3 The generic format described in this guide calls for a description of the significance of the project, the analysis strategy, a listing of data and assumptions, and a presentation of the key economic measures of project impact.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This guide is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.81 on Building Economics.

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2. Referenced Documents

2.1 *ASTM Standards:*²

E631 Terminology of Building Constructions

E833 Terminology of Building Economics

E917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems

E964 Practice for Measuring Benefit-to-Cost and Savings-to-Investment Ratios for Buildings and Building Systems

E1057 Practice for Measuring Internal Rate of Return and Adjusted Internal Rate of Return for Investments in Buildings and Building Systems

E1074 Practice for Measuring Net Benefits and Net Savings for Investments in Buildings and Building Systems

E1121 Practice for Measuring Payback for Investments in Buildings and Building Systems

E1369 Guide for Selecting Techniques for Treating Uncertainty and Risk in the Economic Evaluation of Buildings and Building Systems

E1699 Practice for Performing Value Engineering (VE)/ Value Analysis (VA) of Projects, Products and Processes

E1765 Practice for Applying Analytical Hierarchy Process (AHP) to Multiattribute Decision Analysis of Investments Related to Projects, Products, and Processes

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

E2506 Guide for Developing a Cost-Effective Risk Mitigation Plan for New and Existing Constructed Facilities

2.2 ASTM Adjunct.³

Discount Factor Tables - Adjunct to E917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems - Includes Excel and PDF Files

2.3 ASTM Software Product:

MNL 29 Software to Support ASTM E1765: Standard Practice for Applying Analytical Hierarchy Process (AHP) to Multiattribute Decision Analysis of Investments Related to Buildings and Building Systems

3. Terminology

3.1 Definitions—For definitions of general terms related to building construction used in this guide, refer to Terminology **E631**; and for general terms related to building economics, refer to Terminology **E833**.

4. Summary of Guide

4.1 This guide presents a standard format for presenting the economic impacts of building-related projects. It includes the entire range of private and public construction projects, as well as research related to those projects.

4.2 The generic format provided in this guide helps decision-makers and managers understand the background and objectives of a project, the data from which impacts were calculated, how impact was measured, and the significance of the project's measures of worth.

5. Significance and Use

5.1 This guide reduces the time and effort to communicate the findings of project impact studies and improves the quality of communication between those who measure economic impacts and those who evaluate and interpret them.

5.2 Following the guide assures the user that relevant economic information on the project is included in a summary format that is understandable to both the preparer and user.

5.3 Since the standard guide provides a consistent approach to reporting the economic impacts of projects, it facilitates the comparison of economic studies across projects and over time.

5.4 The guide focuses on projects in construction and building-related research. It applies to government as well as private projects. And while the examples treat building-related projects, the guide is applicable to non-building-related projects as well.

5.5 Building-sector users of this guide include building owners and managers, private-sector construction companies, research groups in building and construction industry trade associations, parties to public-sector construction projects, and government laboratories conducting building-related research.

5.6 Use the guide to summarize the results of economic impact studies that use Practices **E917** (Life-Cycle Costs), **E964** (Benefit-to-Cost and Savings-to-Investment Ratios),

E1057 (Internal Rate of Return and Adjusted Internal Rate of Return), **E1074** (Net Benefits and Net Savings), **E1121** (Payback), **E1699** (Value Engineering/Value Analysis), and **E1765** (Analytical Hierarchy Process for Multiattribute Decision Analysis).

5.7 Use this guide in conjunction with Guide **E1369** to summarize the results of economic impact studies involving natural or man-made hazards, or both, that occur infrequently but have significant consequences.

5.8 Use the guide to summarize the impacts of projects that affect exclusively initial costs, benefits, or savings, as well as projects that affect life-cycle costs, benefits, or savings.

NOTE 1—Examples of projects dealing exclusively with initial costs, benefits, or savings include design modifications or innovative construction practices that reduce labor or material costs, reduce construction duration, or increase construction productivity, but leave future costs, benefits, or savings unchanged.

5.9 Use the guide to summarize the impacts of projects that affect parties that are internal to the organization preparing the summary as well as projects that affect not only the organization preparing the summary but also groups external to the organization.

NOTE 2—Projects whose impacts are internal only correspond to situations where the organization preparing the summary bears all of the costs and receives all of the benefits or savings, or both, from the project. Examples include, but are not limited to, the use of innovative construction practices or alternative building materials, components, or systems that reduce initial costs or future costs, or both, to the building owner.

NOTE 3—Projects with a public-sector component frequently have impacts that reach beyond the organization preparing the summary. Examples include, but are not limited to, building-related research conducted by government laboratories, projects aimed at mitigating the consequences of natural or man-made hazards, or both, that have the potential to cause collateral damage, and highway and bridge constructions that affect traffic patterns.

5.10 There is no limitation to the use of the guide in facilitating communication between project analysts and project managers and other decision-makers. Substantial benefits from using the guide, however, are likely to come from its application in a large institution, such as a federal agency, where many projects are competing for funding, and a systematic presentation of results that can be compared across projects and agencies is needed to allocate efficiently scarce funds.

6. How to Use This Guide

6.1 The generic format for summarizing project impacts is outlined in **Fig. 1**.

6.1.1 To promote a better understanding of the information called for in **Fig. 1**, the numbered headings in the table are cross-referenced to the subsections of **6.2**. Specifically, the information called for under Headings 1.a and 1.b is covered in **6.2.1**, the information called for under Heading 2 is covered in **6.2.2**, and the information called for under Headings 3.a, 3.b, and 3.c is covered in **6.2.3**.

6.2 Presentation and Analysis of the Results of an Economic Impact Assessment—The presentation and analysis of the results of an economic impact assessment are central to understanding and accepting its findings. If the presentation is clear and concise, and if the analysis strategy is logical, complete, and carefully spelled out, then the results will stand

³ Available from ASTM International Headquarters. Order Adjunct No. **ADJE091717-EA**. Original adjunct produced in 1984. Adjunct last revised in 2003.