# Preface

# Essays in Volume I

## Introduction

- Toward More Sustainable Infrastructure: Better Projects and Better Programs
- Infrastructure Projects and Programs
- Evaluating Infrastructure Projects
- Infrastructure, Cities, and Civilization
- Where Do Projects Come From?
- A Framework for Project Evaluation
- Essays and Case Studies

## Basic Economic Concepts

- Introduction
- Supply, Demand, Equilibrium
- Pricing
- Productivity
- Measuring and Improving the Economy
- Trade
- Making Decisions: Utility and Sunk Costs
- Summary

## Public Perspectives: Economic, Environmental and Social Concerns

- Overview
- Benefit/Cost Analysis
- Economic Impacts: Measures Related to the Regional or National Economy
- Environmental Impacts
- Social Impacts
- Safety and Security
- Summary and Discussion

## Comparing Strategies for Improving System Performance

- Introduction
- Discounting and Net Present Values
- Measuring Cost Effectiveness
- Using Weighting Schemes in Multi-Criteria Decision-Making
- Seeking Public Input
- Summary
Public Private Partnerships

Introduction 53
Reasons for Considering a Public Private Partnership 54
Principles of Public Private Partnerships 57
Creating a Framework for a Partnership 58
Determining How Much to Invest in a PPP 60
Example: Using a PPP to Maximize a City’s Ability to Undertake Projects - Toronto’s Highway 407 61
Example: Using Public Investment to Stimulate the Economy - Investment in off-shore oil exploration by the Province of Newfoundland and Labrador 62
Summary 63

Evolution of Infrastructure-Based Systems

Introduction 65
Stage I Technological Experimentation and Demonstration 67
Stage II Widespread, Uncoordinated Implementation 68
Stage III Development of Systems 68
Stage IV Consolidation and Rationalization 69
Stage V Technological and Institutional Advancement 69
  Example: New Technology Can Revive Old Methods – Wastewater Treatment in San Diego, California 70
  Example: Replacing Old Infrastructure with More Effective Systems – Wastewater Treatment in Kaukauna, Wisconsin 70
Stage VI Responding to Competition 71
  Examples: Competition Faced by the Airline Industry 72
Stage VII Mitigating Social and Environmental Impacts 72
  Example: Evolution of London and the Thames Embankment 75
  Example: Building New, More Sustainable Infrastructure – One Bryant Park 76
Stage VIII Retrenching and Obsolescence 77
  21st Century Challenges: Sustainable Infrastructure 77
Summary 79

Case Studies in Volume I

The Franconia Notch Parkway 81

Weighting Schemes for Evaluating Options for Increasing Bus Capacity 83

The Panama Canal
  Early Routes Across the Isthmus 86
  The Panama Railroad 87
  The French Effort 89
  The U.S. Effort 90
  Transfer of the Canal to Panama 94
  Issues for the 21st Century 94

Pearl River Delta: “More than a Bridge”
  Background 100
  How the Team Did Its Work 102
  Lessons Learned from the Pearl River Delta Study 103