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A Rating System to Test Private Investment Decisions in Public Infrastructure Projects

by

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B.S., Civil Engineering (August 1995)
University of California at Berkeley

Submitted to the Department of Civil and Environmental Engineering
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ABSTRACT

This thesis will develop a basic method to evaluate the overall quality of proposed infrastructure projects for private sector financial investment. INFRATEST is meant to aid both potential private infrastructure developers and public entities, which desire to privatize certain infrastructure projects, in selection of the most appropriate infrastructure projects to benefit from the advantages of free enterprise. INFRATEST is premised on 15 equally-weighted factors which represent the major components that affect overall infrastructure project economic, financial, and technical viability. Associated with each of the 15 factors are indicators which measure the important aspects of their respective factors. There are 31 indicators in all and they are evaluated on a numerical scale of one to ten. Factor scores are determined from indicator value averages.

INFRATEST can serve the private developer and the public entity by providing an information base for deciding which privately funded infrastructure development proposals deserve consideration in the capital markets and for deciding which proposed infrastructure projects are to be developed with public or private funds.

Application of INFRATEST to two real-world project proposals, the SAVE project and the Northumberland Bridge project, demonstrated the method's ease and universality of application as well as the method's simple and clear conclusions.

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1. INTRODUCTION

1.1 OBJECTIVES

Continuously decreasing federal government expenditure and rapidly escalating maintenance and replacement demands characterize America's precarious national infrastructure situation. Meeting status quo infrastructure needs will require increased private sector participation in finance, construction, and operation and management of these essential national assets. Not only can such private sector involvement in previously public infrastructure projects take many forms, ranging from differing public-private partnerships to total privatization, it will bring increased attention and study to the most logistically, technically, and financially effective and efficient combinations of design and resource options. Faced with a plethora of proposed infrastructure projects complicated by an abundance of finance, design technology, and procurement options, the engineer or developer consortium or public government must determine an effective and efficient means of evaluating the economic, financial, and technical feasibility of a private infrastructure development entering the capital markets. Also, the need to prioritize various infrastructure projects relative to one another and the need to quantify the impact of various logistical decisions within a projects is evident. Of additional importance and uniqueness to further private sector involvement is project finance, especially the minimization of the cost of capital. The interest paid on invested/expended capital is a significant life-time cost for private enterprise participation in the finance and operation of large infrastructure projects. The relation between the cost of capital and overall project quality is therefore a priority issue. A systematic rating basis for proposed infrastructure projects will provide these necessary results and relations to the private sector.

Objectives of this master of science thesis include:

> Definition and development of a comprehensive economic, financial, and technical, scaled rating method for assessment of private sector investment potential regarding

decisions relating to large infrastructure projects. This rating criterion will result in a single overall project quality rating.

Application of this scaled rating method to current infrastructure projects.

1.2 Significance and Implications of Infrastructure Crisis

Serious public investment shortfalls and stifling public administrative inefficiencies necessitate increased private sector participation in meeting today's infrastructure needs. Private sector involvement in infrastructure finance, construction, and operation and management is essential to alleviating the capital, technological, and bureaucratic crisis perpetuated by the federal government.

Public expenditure for transportation infrastructure in the United States is critically inadequate. Until 1998, federal investment for infrastructure had been consistently decreasing since 1980. Between 1955 and 1980, state and local governments relied heavily on federal grant programs to fund interstate highway, transit system, and wastewater treatment plant developments. The $2.5 trillion plus in public infrastructure assets owned by the government are in desperate need of normal service maintenance[1]. The U.S. situation can be found throughout the world. These investment shortfalls depict the political reality that when a government's revenues are inadequate and deficits must be lowered, capital spending on infrastructure is often among the first casualties with infrastructure operations and maintenance funds close behind. Governments throughout the world find this policy more politically advantageous than reducing public employment, wages, or other social programs despite the long-term economic costs of minimal infrastructure spending.

However, despite these budget cutbacks, spending on infrastructure development worldwide is substantial. Forecasted goals for spending on infrastructure are high. The World Bank's 1994 World Development Report states that developing countries continue to spend more

than $200 billion per year on infrastructure investment, of which more than 25% is allocated to highways; the remainder is allocated to water and sanitation, electric power, and telecommunication projects[2]. Expectations for funding from the private sector have increased exponentially as public expenditures, including loan commitments from global finance institutions, have declined relative to the growth in demand. Methods of financing infrastructure projects with private capital are assuming increasing significance.

For instance, toll road projects confirm increasing private sector participation in worldwide infrastructure projects. Surveys conducted by the International Bridge, Tunnel, and Turnpike Association (IBTTA), the International Road Federation (IRF), and by industry publications such as *Public Works Financing* (PWF), *World Infrastructure*, *Infrastructure Finance*, and *Infrastructure* show that the need for private financing of infrastructure is increasing at a rate faster than the industry's ability to respond. Southeast Asian countries alone have prepared plans to spend more than $100 billion on transportation infrastructure by the year 2000[3]. The 1993 IBTTA survey of global toll roads listed 185 projects with an estimated capital cost of $122 billion. Since that time, numerous additional toll road projects have been identified and the opportunity for private investment could easily exceed $200 billion over the next 10 years. Additionally, some larger countries are now re-evaluating their financing of national highway networks, considering new approaches to attracting international investments. For instance, China is planning a privately financed toll road network of 35,000 km. India is planning to link its major cities with a 10,000 km network of toll roads, at a cost estimated at $13 billion by the Asian Development Bank, which expects to provide substantial loans and loan guarantees over time to these major toll road projects[4].

In addition to reducing fiscal pressures, private sector involvement in infrastructure investment allows for increased design innovation and administrative efficiency. Not only do

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[1] Miller 1996.
[2] Beato 1996.
[3] McConnell 1996.
[4] McConnel 1996.

status quo federal procurement statutes and regulations inhibit innovation in design, but their very complexity raises issues of inefficiency[5].

Although most infrastructure assets were privately owned, financed, and managed in the 19th century, over time the majority of western developed countries nationalized most infrastructure companies so that by the middle of the 20th century, public agencies owned, financed, and managed most infrastructure assets. Design and/or construction of infrastructure works was usually the only relevant private-sector participation in the provision of infrastructure services, and most of the time this took place under a contract from a public agency. This American federal procurement system impressed on the states is adverse to technological innovation. Inhibiting innovation between engineers and constructors, the administrative process dictates that engineering and construction consultants be separate from one another pertinent to infrastructure development. Engineers are required to provide design, not performance, specifications. This tends to exclude new technologies and precludes the choice of one leading technology over another. As a result, key elements of American infrastructure are often technically obsolete.

Furthermore, public procurement procedure entails regulations and laws detailing the smallest minutia of infrastructure investment. Since their inception in 1947, these federal procurement rules for infrastructure have developed into a complex administrative process. Such a time consuming and resource intensive procedure has so evolved into an end in itself. This current federal paradigm represents a hopeless bureaucratic situation replete with administrative inefficiencies which encourage states and local governments to compete with one another in Congress and before federal agencies for higher allocations of non-existent federal cash, compromising infrastructure project integrity and quality. Infrastructure development has become a "zero-sum game" in which projects are initiated solely on the basis of available public funds, without consideration of actual project merits[6].

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[5] Miller 1996.
[6] Miller 1996.

An expanded private sector role in infrastructure is founded in the government's inability to fund infrastructure projects and in the government's ineffectualness to meet these societal demands for new infrastructure in an innovative and efficiently administered manner. Increased private sector participation entails more access to private capital markets and the competitive and economic advantages of free market enterprise. Such involvement will enable infrastructure solutions which are not plagued by current-day funding, innovation, and bureaucratic difficulties and inefficiencies.

Today, the role for public sector participation in infrastructure services needs to quickly evolve from one of owning and managing infrastructure assets to one of planning and regulating privately owned and managed assets. Balancing the interests of consumers and private sector firms should be of utmost concern. Public deficits and increasing social demands will facilitate governments to privatize infrastructure assets to increase revenues, reduce public-sector participation in new investments, and decrease public expenditures resulting from public-enterprise losses. State-owned enterprises have performed poorly in three areas: meeting growing consumer demand, upgrading technology, and providing adequate customer services. The main causes of this are inadequate pricing, poor financial management, and the lack of appropriate incentives.

Although private-sector participation in infrastructure provision will increase efficiency and reduce fiscal pressures, infrastructure assets possess characteristics that demand some level of public-sector responsibility. The large magnitude of investments, economies of scale and scope, externalities, and the nontradable nature of the output of infrastructure assets are features that will require public-sector involvement to avoid monopolistic behavior or other market failures. As governments usually wish to ensure that infrastructure services do not hinder economic growth, private-sector participation in infrastructure provision requires an arrangement between the private and public sectors where the public sector regulates the provision of the service and, in some cases, may be involved in some aspects of the provision of the service. Such public-sector involvement introduces other noncommercial risks for the private sector, risks that must be adequately dealt with.

1.3 Necessity of Infrastructure Project Quality Rating System

Because of the sheer size and urgency of unsatisfied infrastructure needs in most developed and developing countries alike, planners, administrators, and engineers and developers in such countries will be faced with the formidable task and responsibility of deciding which project scopes will be best met by using public or private dollars for design, delivery, and/or operation. In addition, as more of these infrastructure projects are taken into the private sector, a greater number of project proposals will also be generated. To save the private developer unnecessary transaction costs, it will be essential to screen out many incomplete or unviable projects before their presentation to capital market experts. A systematic application of an adequate method to augment the information base for deciding which privately funded infrastructure development proposals deserve consideration in the capital markets and for deciding if a proposed infrastructure project is to be developed with public or private funds is necessary. An overall proposed infrastructure project quality rating system can meet these objectives.

An overall infrastructure quality rating system will also serve to prioritize infrastructure projects by merit within a infrastructure portfolio. Limited public or private resources can then be allocated to the most viable and technologically and economically sound infrastructure developments. In addition, changes to a project's finance, design or construction technology, and/or management and operation plan can be measured by differences in overall project quality rating. The total effect of changes in such project variables can thus be quantified and gauged appropriate and/or necessary.

1.4 Definitions

Infrastructure establishes the physical framework that supports and sustains almost all economic activity. Infrastructure projects all share high fixed costs, strong ties to economic

development, lengthy service life, interaction within a network of other infrastructure projects, and a tradition of public sector involvement. At the very least, this encompasses facilities for transport, such as highways, public transit, airports, and airways, water resources and supply, and waste management. Because of their length planning and construction schedules and high fixed costs, major infrastructure projects usually involve a greater degree of uncertainty and higher financial risks than typically short-term industrial and commercial investments. Once built, such infrastructure projects have near monopolistic power in local markets and are often built as part of a larger system, such as a national road network or a regional water supply system. To protect the economic and safety interests of the public, governmental regulation and coordination are often involved in infrastructure development.

Private involvement in infrastructure development can take various forms. The degree of this private sector participation, most likely within a public-private partnership, is predicated on which party or parties is responsible for obtaining and supporting the financing of the project, leading and funding its design, planning, and construction, holding legal title, and managing the facility and collecting revenues or other exactions. For most public use projects, governments will always have a large role in regulating safety, quality of service, and rate/profit setting.

Common forms of public-private partnerships are described below:

Build-own-operate (BOO): A private consortium finances and builds a facility, and then owns, operates, and collects revenues for an unlimited time.

Build-operate-transfer (BOT): A private consortium receives a concession to finance, build, own, and operate a facility for a limited time period (usually 20-40 years), after which, the facility is given to the sponsoring government free of charge.

Build-transfer-operate (BTO): A private consortium finances and builds a facility and transfers ownership to the government immediately upon completion. The private

consortium then leases and operates the facility and collects revenue for a limited franchise period. Although the government owns the facility, full financial responsibility, without tort liability, remains with the original investors.

Buy-build-operate (BBO): A private consortium buys an existing facility from the government, expands or repairs it, and then operates and collects revenues on the facility either for a limited time or permanently.

Lease-develop-operate (LDO): A private consortium leases an existing facility, expands, repairs, and operates it, collects revenues to recover its investment, and shares profits with the government owner. Title is continuously held by the government; expiration of the lease can be tied to the final recovery of the capital cost or be extended for indefinite periods.

2. INFRATEST

2.1 INFRATEST INTRODUCTION

This thesis will develop a basic method to evaluate the overall quality of proposed infrastructure projects for private sector financial investment. INFRATEST is meant to aid both potential private infrastructure developers and public entities which desire to privatize certain infrastructure projects in selecting the best infrastructure projects to benefit from the advantages of free enterprise. For the private developer, it can be used to determine a preliminary assessment of a project's economic, financial, and technical feasibility and used to recommend those projects which are qualified for presentation to capital market investors, saving unnecessary transaction costs. INFRATEST can also be used to set benchmark standards for infrastructure development privatization and/or for infrastructure development private capitalization. It can help public governments discern which projects can be most effectively completed by the private developer. As a project packaging tool, INFRATEST can be used to facilitate successful and effective presentation of only the most suitable and appropriate infrastructure projects to capital market investors by a private developer or to private developers by a public entity. Comprised of various rating criterion, INFRATEST will also increase understanding of the factors which comprise a quality infrastructure project; that is economically, financially, and technically viable. In addition, the effect on total infrastructure project quality of an adjustment of any one of these factors can also be better measured. INFRATEST identifies and organizes the principal factors that affect infrastructure project quality for rational analysis and subjective qualification, resulting in an overall project quality rating.

2.2 FACTOR AND INDICATOR ORGANIZATION

Evaluating an infrastructure project's quality is a complex process that involves sorting through a number of factors. These factors include: infrastructure market constitution,

service territory demand, developer infrastructure industry experience, developer industry position, developer management characteristics, financial information quality, infrastructure project financial information such as projected earnings stability, debt coverage adequacy, financial leverage, and financial flexibility, financing package, completion risks, regulatory climate, project environmental, and project technical merits. Not only are there a large number of factors to evaluate, many of them are difficult to isolate and quantify. Further, relations between the factors add complexity. Some are more important than others, but often this cannot be determined until all the factors have been assembled.

INFRATEST is premised on these aforementioned 15 factors which represent the major components that affect overall infrastructure project quality. Associated with each of the 15 factors are indicators which measure different aspects of their respective factors. Each factor can be described and measured qualitatively or quantitatively by its indicators. There are 31 indicators in all. Figure 1 thru Figure 4 depicts the 15 factors and their associated indicators.

Factors have been classified into one of three basic categories: business, finance, or project specific. Taken together, they can be used as a guide to organize and assemble the various elusive issues that must be looked at in assessing overall infrastructure project quality.

Business specific factors represent external market influences on the infrastructure project and the project developer(s). Included are project-unique market conditions and risks and developer expertise and market position. Business specific factors account for the economic motivation of the project and for the economic rationale for the developer.

Finance specific factors encompass quantitative representation of the expected financial picture of the infrastructure project. Beyond actual projected revenues and estimated expenditures, earnings stability, debt service, cash flow adequacy, and financial flexibility are all examined. In considering these areas of analysis, an assessment of the infrastructure projects viability to exist as a financially solvent entity is determined.

Project specific factors entail characteristics unique to the proposed infrastructure project such as financing scheme, completion risks, public-private agreements pertaining to operational responsibilities, and project technical and environmental advantages. These are internal and inherent project factors which describe the merits or detriments associated with the particular infrastructure project's financing package, public-private agreement, delivery system, and design plans.

Indicator assessment is of paramount importance to INFRATEST. The development of these essential indicators must be guided by thought toward adjusting the definitions and significance of some indicators to capture the uniqueness of individual projects. No indicator is a universal standard. Rather each is an adaptive guideline for illuminating project characteristics. Further, as no single indicator is conclusive, all must be studied simultaneously to ascertain the total picture.

2.3 Criterion Derivation

Rating criterion are determined from a synthesis of *Standard & Poor's Credit Overview* (Bond Rating Criteria), *Standard & Poor's Debt Rating Criteria* (Debt Rating Criteria), Fitch reports rating municipal and revenue bonds issued by public-enterprises for infrastructure projects, and related bond and bond rating literature found within the M. I. T. library system.

Of particular importance are the Industrial, Utilities, and Project Finance Bond Rating Criteria sections found in the Standard & Poor's sources. These criterion have been analyzed and modified to suit the unique considerations of infrastructure projects found from a survey of the aforementioned Fitch reports.

Care has been taken to extract only the broad ideas found in these sources. Specific application of the particular concepts which make up INFRATEST have been synthesized from the writer's individual understanding, from helpful comments from Steve Weinstein of

the Duff & Phelps Credit Rating Company and from guidance received from my thesis advisors Henry L. Michel, Chairman Emeritus of Parsons Brinckerhoff, Incorporated and Lecturer at M. I. T. and John B. Miller, Assistant Professor of Civil and Environmental Engineering at M. I. T.

2.4 Rating Procedure

Beyond providing a definitive criterion focus for infrastructure project value measurement, the end result of INFRATEST is an overall project quality rating. This overall project quality rating and, indeed, its components, the principal factors and their indicators, are all expressed numerically. Numerical values are chosen for measurement expression; that is, to provide a simple basis for factor/indicator comparison and project prioritization. It is recognized that the use of numerical values does not transform an inherently subjective process to an objective one. INFRATEST will be used to gauge the readiness of a project for financial markets or to gauge the viability of a project for private sector development, the ease of comparison and prioritization offered by numerical values promises advantages of efficiency and clarity.

In some cases, inadequate information pertaining to one or more indicators will prevent a thorough assessment of the project's related strengths or weaknesses. INFRATEST analysis allows for inadequate information to be taken as a poor showing of the project's potential for such an indicator. For this rating system, for a specific indicator, a lack of information and a project's weak potential similarly affect the proposed infrastructure project's quality in a detrimental fashion.

INFRATEST methodology is as follows:

> Determine the degree of project information adequacy for complete factor and indicator assessment. Complete the INFRATEST checklist.

All factors are assessed by examining their related indicators and all indicators are evaluated on a scale of one to ten. For those factors where sufficient project information permits a sound analysis, a value of one represents an extreme deficiency of the proposed infrastructure project pertinent to a given indicator. A value of ten represents a strong advantage of the proposed infrastructure project with respect to a given indicator. Scaling definitions and descriptions are presented for numerical value intervals. These are determined from a survey and analysis of Fitch Reports and relevant literature and from Standard and Poor's Key Median Ratios. For those indicators where insufficient project information precludes a sound analysis, a value of one represents an extreme deficiency of specific indicator project data. Higher values represent information deficiencies of lesser significance. All factors' scores are calculated by averaging its indicators' values.

Business, financial, and/or project specific scores are computed by summing the associated factors' scores. An overall project quality rating is found by summing all factors' scores.

Indicator values, individual factor scores, business, financial, and/or project specific scores, and/or an overall project quality rating are reported. Line graphs, bar charts, and pie charts are utilized in presenting the factor scores, business, financial, and/or project specific scores, and the overall project quality rating.

Further conclusions entail calculation of percentile rankings for business, financial, and/or project specific scores and for the overall project quality rating. Close attention is paid to the total score possible.

Figure 5 summarizes the aforementioned procedure.

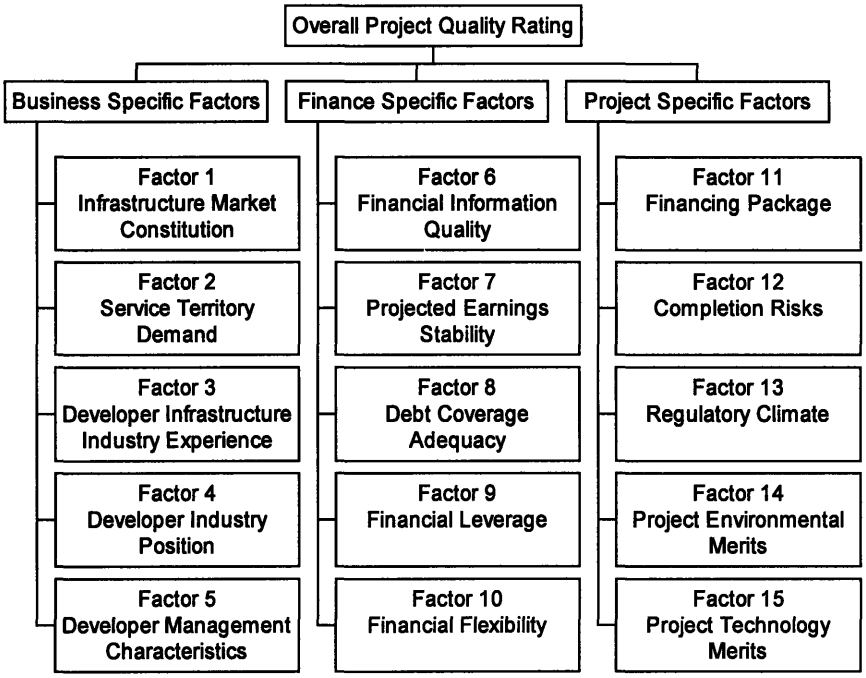

Figure 1. INFRATEST Factor Organization

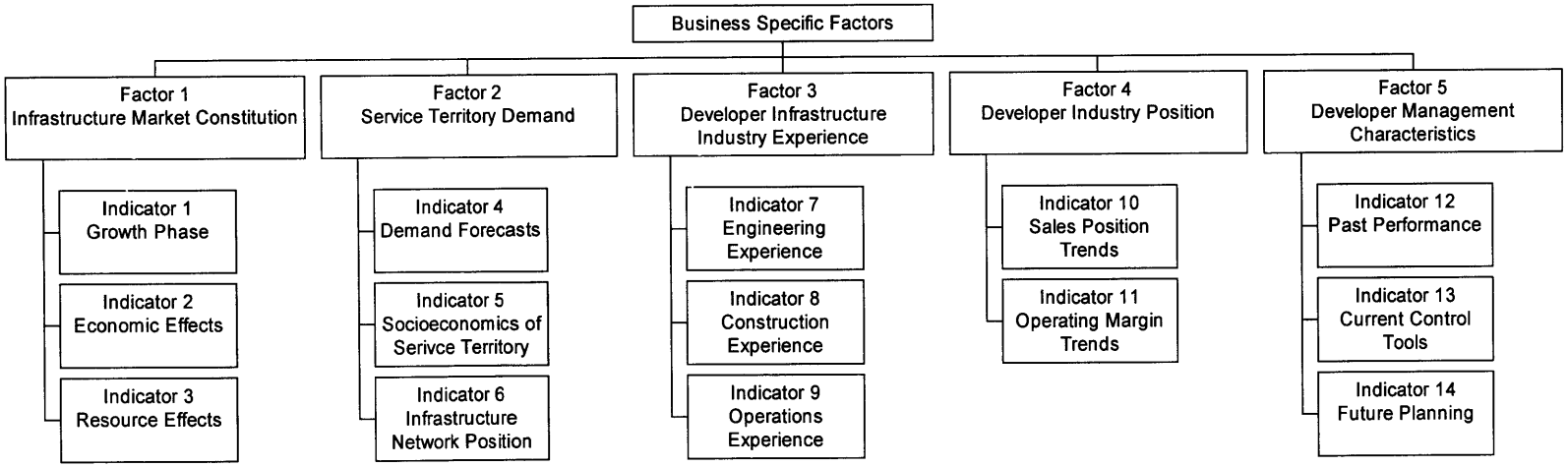

Figure 2. INFRATEST Business Specific Factor Organization

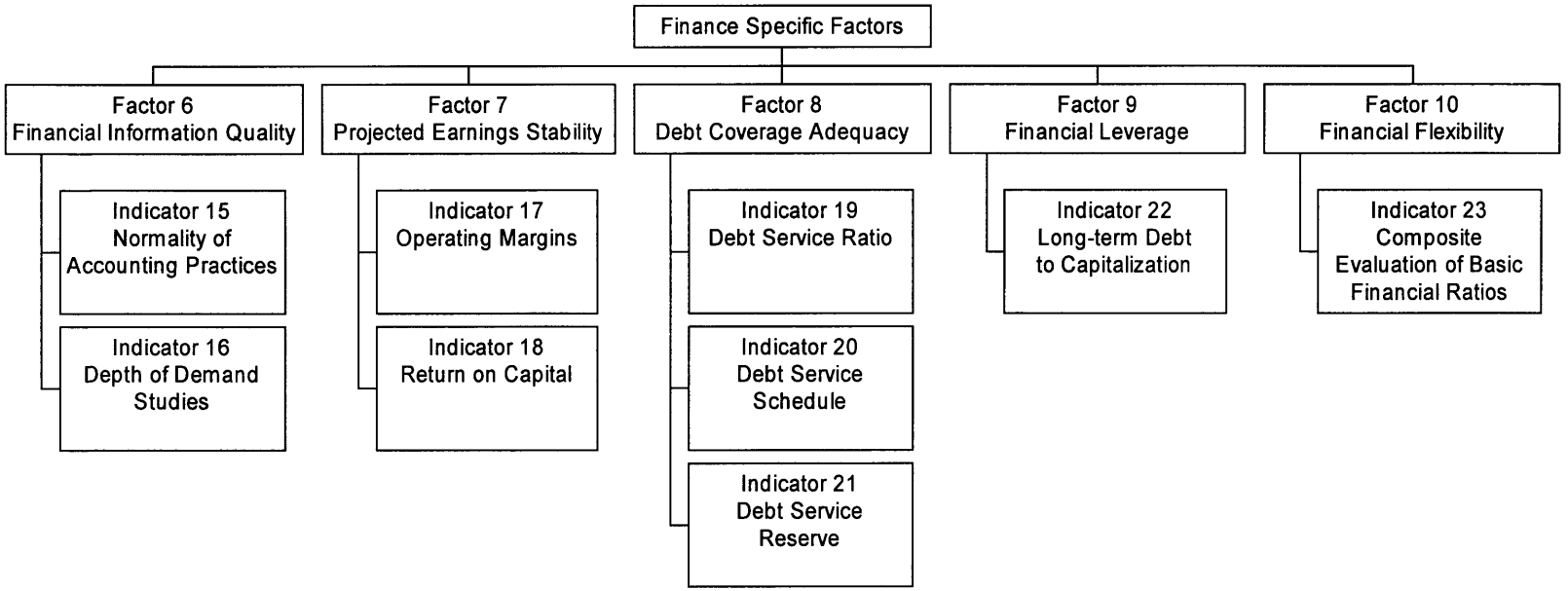

Figure 3. INFRATEST Finance Specific Factor Organization

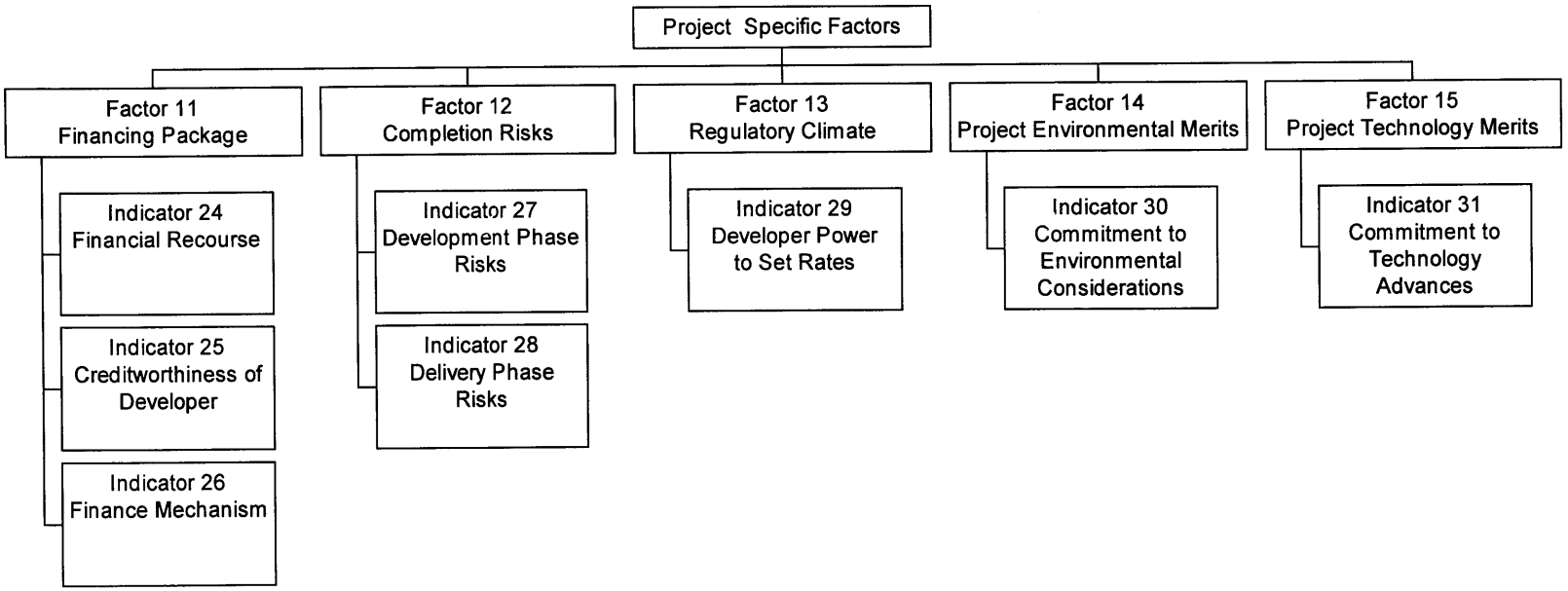

Figure 4. INFRATEST Project Specific Factor Organization

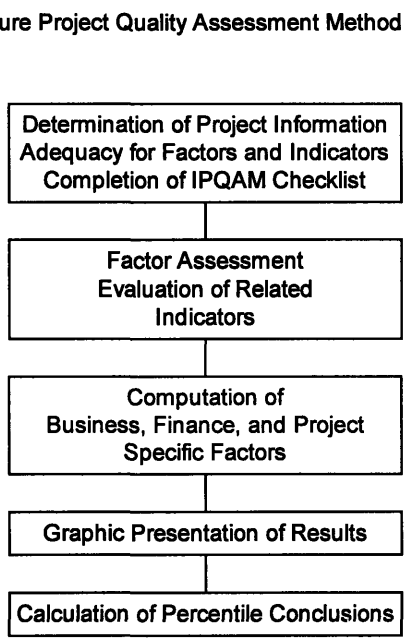

Figure 5. INFRATEST Procedure

3. BUSINESS SPECIFIC FACTORS

3.1 Business Specific Factors Introduction

Business specific factors depict the market influences inducing the proposed infrastructure project and the developer's courses of action. Industry risks unique to the proposed infrastructure project as well as the developer's proven ability to overcome these challenges are examined in this section.

3.2 Factor 1: Infrastructure Market Constitution

Infrastructure market constitution encompasses not only the free enterprise behavior, but also the characteristics of a particular infrastructure industry in the context of the overall economy and its trends. Examining the strengths and vulnerabilities of a particular infrastructure industry will allow placement of the proposed infrastructure project relative to these inherent industry market advantages and risks. Such concerns include historic and future growth trends and past involvement of the private sector. Output and/or service marketability is examined through essentiality of the service/output, ability to adapt to fluctuating economic conditions, and degree of competition involved in providing these services/outputs. Indicators include growth phase, economic effects, and resource effects. Such indicators describe the growth potential of an infrastructure industry as well as analyze the various influences which impact this growth.

From evaluation of Factor 1 indicators: Growth Phase, Economic Effects, and Resource Effects, a reasonable assessment of the general course of an infrastructure industry can be made.

Factor 1 score is determined from an average of its indicator values.

Although most factors affect infrastructure project quality equally, infrastructure market constitution provides an umbrella influence over other criteria. Conclusions regarding infrastructure industry strength and degree of risk will go a long way toward setting the upper limit to which any infrastructure project rating may garner in said industry. Infrastructure industries regarded most advantageously would possess constitutions with strong demand growth, an ability to maintain margins without impairing future prospects, and flexibility in the timing of capital outlays[7].

3.2.1 Indicator 1: Growth Phase

Industry growth phase encompasses the relationship between demand for an infrastructure service/output and the price the consumer is willing to pay for such products. A stabilized infrastructure industry is characterized by demand for the infrastructure products at prices reasonable to generate sufficient revenue for an adequate return after paying operations and management expenses and servicing. In a growing infrastructure industry, consumers are willing to pay a premium price for strongly demanded infrastructure products. These infrastructure services/outputs can be marketed at prices beyond those required to generate a beyond investment grade return. In a declining infrastructure industry, demand for infrastructure products also exists. However, consumers are not able or willing to pay the prices necessary to make the privatization project economically feasible.

Growth considerations entail: industry phase (growing, stabilized, or declining) and industry cyclicity (own business cycles, moves with the overall economy cycles, or moves contrary to the overall economy cycles).

Values between 7 - 10 reflect a moderately to substantially increasing growth potential trend for said infrastructure industry. Such an increasing growth potential trend is expected to be sustained over the duration of the project's service life. A moderately increasing growth trend is defined as consistent annual increases in growth with each annual increase equal to

[7] Standard and Poor's 1986.

the absolute value of overall regional economic growth. A substantially increasing growth trend is defined as consistent annual increases in growth with each annual increase greater than the absolute value of overall regional economic growth. A continuously positive growth trend implies a lengthy infrastructure industry business cycle which is independent of general economic trends.

Values between 3 - 7 reflect reasonably stabilized and level growth expectations. These values include two possibilities. The first is that growth in said infrastructure industry has reached a plateau and will remain constant for the duration of the project service life. The second is that increasing or decreasing growth projections over the entire project service life average out. These scenarios imply a shorter industry business cycle which is affected negatively or positively by general economic trends.

Values between 1 - 3 reflect a substantially to moderately decreasing growth potential trend for said infrastructure industry. Such a decreasing growth potential trend is expected to be sustained over the duration of the project's service life. A moderately decreasing growth trend is defined as consistent annual decreases in growth with each annual decrease equal to the absolute value of overall regional economic growth. A substantially decreasing growth trend is defined as consistent annual decreases in growth with each annual decrease greater than the absolute value of overall regional economic growth. A continuously negative growth trend implies a lengthy infrastructure industry business cycle which is independent of general economic trends.

3.2.2 Indicator 2: Economic Effects

Economic effects focus on the free-market influences which discourage or encourage infrastructure industry growth. Economic effects encompass: level of competition (high, medium, or low), type of competition (local, regional, or national), and basis of competition (price, essentiality of service, quality of product, technology applied, distribution capabilities,

or image). Of particular importance is the pricing scheme. Pricing can vary with quality and/or quantity.

Values between 5 - 10 describe an overall slight to significant augmenting and enhancing effect on growth projections from market situation and technology considerations. A dominant market share and low or unrealized market penetration favorably affect growth potential. Technological advances which can be applied in the future can lower infrastructure product or service price and improve quality, also beneficially influencing growth potential.

Values between 1 - 5 describe an overall significant to slight debilitating and reducing effect on growth projections from market situation and technology considerations. A small market share and high market penetration unfavorably affect growth potential. Continuous obsolete technology application or lack of developing technology can hinder product or service quality, also hurting growth potential.

3.2.3 Indicator 3: Resource Effects

Resource effects measure the labor and raw material aspects which influence growth. Labor aspects encompass the degree of unionization, labor-contract negotiation procedures and past outcomes to disputes, and vulnerabilities to strike. A sufficient base of skilled and unskilled labor is necessary. Raw material aspects include the degree of control of key materials (long-term supply contracts or questionable sources) and vulnerability of supply to political, environmental, and energy-related pressures. Some projects require that a resource or product exist or be available in order for the project to operate. These resources may not be available in sufficient quantities and/or at prices that allow for infrastructure industry development.

For international projects, concerns regarding the securing of stable levels of imported labor and raw materials are also considered.

Values between 5 - 10 describe an overall slight to significant augmenting and enhancing effect on growth projections from labor and raw material aspects. Future growth prospects are impacted by level of unionization in infrastructure industry, historic union demands and negotiating tactics, and propensity to strike. In addition, availability and securing of long-term resources necessary to the infrastructure industry is also key in determining future growth prospects. Overseas expertise with imported work force and raw materials also influences future growth prospects.

Values between 1 - 5 describe an overall significant to slight debilitating and reducing effect on growth projections from labor and raw material aspects.

3.3 Factor 2: Service Territory Demand

This factor considers the level and stability of long-term demand for the proposed infrastructure project's products or services from a micro-economic perspective. Evidence for the consumers' market appetite for infrastructure products includes demand forecasts for infrastructure services/outputs examined against economic conditions and demographic diversity of the service area. Inclusion within a well-managed and well-planned capital improvements plan or infrastructure network also helps to qualify long-term need for the proposed infrastructure products. Indicators are demand forecasts, socioeconomics of service territory, and infrastructure network position.

Consideration of Factor 2 indicators: Demand Forecasts, Socioeconomics of Service Territory, and Infrastructure Network Position, leads to an assessment of service territory demand and demand stability, reflecting both quantitative and qualitative aspects.

Factor 2 score is determined from an average of its indicator values.

3.3.1 Indicator 4: Demand Forecasts

Demand forecasts for infrastructure project products or services represent a quantitative measure of long-term need for these outputs. Evaluations should include elasticity of this demand, diversity of customer base, and availability of competing routes, technologies, methods, and/or service providers.

Values between 7 - 10 reflect a moderately to substantially increasing demand potential within the service area territory for said infrastructure outputs over the duration of the project's service life. An average annual demand increase of two to three percent is considered moderate. An average annual demand increase of five to seven percent is considered substantial. Increasing demand forecasts imply near inelasticity of demand, a sustained diverse customer base, and near monopolistic climate for provision and pricing of infrastructure project outputs.

Values between 3 - 7 reflect a reasonably stabilized and level demand forecast. This value includes two possibilities. The first possibility is that demand for said infrastructure outputs within the service territory has reached a plateau and will remain constant for the duration of the project service life. The second possibility is that the increasing or decreasing demand forecasts over the entire project service life average out. Such conditions are common with a more elastic demand, a more concentrated customer base, and normal competition levels for provision and pricing of infrastructure project outputs.

Values between 1 - 3 reflect a substantially to moderately decreasing demand potential within the service area territory for said infrastructure outputs over the duration of the project's service life. An average annual demand decrease of two to three percent is considered moderate. An average annual demand decrease of five to seven percent is considered substantial. Decreasing demand forecasts imply extremely elastic demand, an extremely concentrated customer base, and extremely competitive levels for provision and pricing of infrastructure project outputs.

3.3.2 Indicator 5: Socioeconomics of Service Territory

Market demand for infrastructure project outputs is also influenced by the socioeconomic composition of the consumers in the service territory. Socioeconomic variables encompass the size and growth rate of the market, the diversity of the service area economy, and the economic strength of the service area as measured by trends in population, unemployment, and per capita incomes.

Values between 5 - 10 describe an overall slight to significant augmenting and enhancing effect on demand forecasts from socioeconomic influences. Values closer to 10 characterize a highly diverse, balanced, healthy, and growing service area economic base with increasing investment, construction activity, and employment, a wealthy consumer base with high disposable and buying incomes, and an increasing population.

Values between 1 - 5 describe an overall significant to slight debilitating and reducing effect on demand forecasts from socioeconomic influences. Values closer to 1 characterize a specialized and stagnant service area economic base with little or no new investment, construction, and employment, a lower income consumer base with low disposable and buying incomes, and a decreasing population.

3.3.3 Indicator 6: Infrastructure Network Position

A proposed infrastructure project's facility location, accessibility, and size within the overall status quo infrastructure network also affects long-term service territory demand. Functioning as a major connection or primary source or as an extension route or secondary source impacts both immediate demand and projected demand and stability of such demand.

Values between 5 - 10 describe an overall slight to significant augmenting and enhancing effect on demand forecasts from the infrastructure project's network position. A favorable infrastructure network position is one that functions as a defined element of a well-planned and researched capital improvements plan. Further, a favorable position is one that is essential to the network in that it is a major artery or connection. These types of network positions, prime positions which capitalize on increased demand from positive socioeconomic changes within the service territory, ensure that infrastructure project demand is not only continuous, but increasing throughout the project's service life.

Values between 1 - 5 describe an overall significant to slight debilitating and reducing effect on demand forecasts from the infrastructure project's network position. An unfavorable infrastructure network position is one that is part of a ill-conceived and arbitrary capital improvements plan. Further, an unfavorable position is one that is redundant or secondary in the overall infrastructure network.

3.4 Factor 3: Developer Infrastructure Industry Experience

A developer's level of related experience plays an influential role in determining the quality of any project. Infrastructure is no exception. Assessment toward a developer's ability to accomplish engineering design, environmental review, right-of-way securing, construction, and project operation and maintenance is made for this factor. Relevant project experiences and past responsibilities are considered. Indicators are engineering experience, construction experience, and operations experience.

From evaluation of Factor 3 indicators: Engineering Experience, Construction Experience, and Operations Experience, a qualitative notion of pertinent developer experiences is ascertained.

Factor 3 score is determined from an average of its indicator values.

3.4.1 Indicator 7: Engineering Experience

Engineering experience is an important consideration when assessing the potential success of a project. Significant positive and related design experience is critical. Demonstration of like, efficient, and innovative technological advances in previously used designs is beneficial.

Values between 7 - 10 represent high levels of related engineering analysis and design. Higher values are associated with developers whose engineering portfolios are distinguished by extreme commitments to high quality and technically advanced and resource efficient successful designs.

Values between 3 - 7 represent average levels of related engineering analysis and design. Such developers possess adequate pertinent design experience. While designs are usually successful, adherence to the highest levels of quality, technology, and efficiency may be compromised.

Values between 1 - 3 represent low inadequate levels of engineering analysis and design.

3.4.2 Indicator 8: Construction Experience

For this indicator, the developer or his contractors are evaluated for related construction experience and credit quality. Records for previous projects' on-time completions, on-budget finishes, and meeting of required performance standards are examined. Stronger builders should be able to demonstrate previous familiarity with the design and construction technology and the project type. In addition, positive experiences in the country where the project is located is desireable as it will aid the contractors in understanding the work environment and the likely obstacles that they may face. Financial health of the contractors is also assessed to ensure that they have the necessary resources to complete the project.

Values between 7 - 10 represent high levels of related construction experience. Higher values are associated with portfolios characterized by construction of similar type and technology projects. Demonstrated records of similar expertise in completing projects on-time, on-budget, and to specified performance also garner higher values. Commitments to delivering a high quality and high performance facility are evident.

Values between 3 - 7 represent adequate levels of related construction experience. Construction of the proposed infrastructure project does not fall exactly into this builders realm of experiences. Nevertheless, such values represent builders with proven records of construction completion within time scheduled and costs budgeted and to performance specified.

Values between 1 - 3 represent low inadequate levels of related construction experience.

3.4.3 Indicator 9: Operations Experience

The operator is assessed on his ability and motivation to carry out his obligations. Strong operators should easily prove a high capability to operate the facility efficiently and effectively. Past experience with similar project types and technologies can be used as empirical examples. The staffing of the project is also examined. The facility should be run by competent parties.

Values between 7 - 10 represent high levels of related operating experience. Higher values are associated with portfolios characterized by a high percentage of similar and successful operations responsibilities. Highly efficient and quality maintenance and management for like infrastructure projects is evident when considering the experience of these operators. Industry recognition for such special expertise is readily acknowledged. Such operators are highly motivated to run a financially successful infrastructure development.

Values between 3 - 7 represent adequate levels of related operating experience. Past maintenance and management of other projects is described as cost-effective, time-efficient, and of high quality. However, the scopes of responsibilities and work tasks for the proposed infrastructure project falls slightly outside the experience of this operator. Such operators are nevertheless recognized as highly skilled and motivated, but their experiences are not uniquely suited for this particular infrastructure development.

Values between 1 - 3 represent low inadequate levels of related operating experience.

3.5 Developer Industry Position

In addition to a developer's level of related experience, depth of resources and extent of business connections also contribute to the quality of an infrastructure project. As such, developer industry position serves an important purpose in that it exists as a qualitative and relative measurement of such abstracts. Indicators for developer industry position include: sales position trends and developer operating margin trends.

Factor 4 indicators: Sales Position Trends and Operating Margin Trends quantify the effect of a developer's industry position on overall infrastructure development strength.

Factor 4 score is determined from an average of its indicator values or its from an average of its six intermediate indicator values.

3.5.1 Indicator 10: Sales Position Trends

For this indicator, the inherent link between sales position, which is a measure of both actual size and success, and developer expertise, resources, and connections is assumed. Besides the actual sales positions, such a sales ranking places the developer in the relative context of

his/her industry. Past and future sales position trend analysis should entail assessment of both rate of sales position changes and stability of sales positions. Future sales positions should be tempered by consideration of firm and industry assumptions.

Measurement is made in terms of total annual sales and trend analysis is conducted for five to ten year backward and forward periods.

This indicator value is composed of an average of three intermediate indicator values: Current Sales Position, Backward Trend of Sales Positions, and Forward Trend of Sales Positions.

The value assigned to the first intermediate indicator multiplied by ten corresponds to the percentile placement of the developer's industry position, as measured in total annual sales. For example, a value of 9 would correspond to a developer sales position in the 90^{th} percentile. This developer's total annual sales are larger than 90% of his/her industry.

An analysis of the backward trend of sales positions is carried out for the second intermediate indicator.

Values between 7 - 10 reflect a moderately to substantially increasing historic trend of developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, a total increase in total annual sales of 15% over five to ten years is considered a moderately increasing trend. A total increase in total annual sales of 25% over five to ten years is considered a substantially increasing trend.

Values between 3 - 7 reflect a reasonably stabilized and level historic developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, total variations in developer total annual sales of plus or minus five percent over five to ten years constitute an indicator value of 5.

Values between 1 - 3 reflect a substantially to moderately decreasing historic trend of developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, a total decrease in total annual sales of 15% over five to ten years is considered a moderately decreasing trend. A total decrease in total annual sales of 25% over five to ten years is considered a substantially decreasing trend.

An analysis of the forward trend of sales positions is carried out for the third intermediate indicator.

Values between 7 - 10 reflect a moderately to substantially increasing future trend of developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, a total increase in total annual sales of 15% over five to ten years is considered a moderately increasing trend. A total increase in total annual sales of 25% over five to ten years is considered a substantially increasing trend.

Values between 3 - 7 reflect a reasonably stabilized and level future developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, total variations in developer total annual sales of plus or minus five percent over five to ten years constitute an indicator value of 5.

Values between 1 - 3 reflect a substantially to moderately decreasing future trend of developer industry position (as measured in total annual sales). Assuming overall average economic growth of two to three percent annually, a total decrease in total annual sales of 15% over five to ten years is considered a moderately decreasing trend. A total decrease in total annual sales of 25% over five to ten years is considered a substantially decreasing trend.

3.5.2 Indicator 11: Operating Margins Trends

Developer operating efficiency is assessed by measurement of firm operating margins with regard to pricing, cost advantages associated with design innovations, and cost advantages

associated with technological efficiencies in construction. A developer's own operating efficiency is an indicator of his/her capabilities to manage a successful infrastructure project, integrating finance, design, construction, and management. Indicators include current, past, and future operating margin figures.

These figures are analyzed for increasing or decreasing trends founded upon and/or related to pricing policy, economic resource supply, and construction efficiency. Continuous contracting for lower-cost construction resources and equipment and continuous maintaining of good relations between financiers, designers, contractors, and managers ensures a smooth and thus constant supply of necessary resources. Further, construction efficiency is accounted for by effectiveness of leading technology applied and integration of design and construction disciplines. On-site safety records are also important.

This category also covers a developer's historical operating margins and assesses his/her ability to maintain or improve them based on pricing, cost advantages, or technological construction and design innovations.

This indicator value is comprised of an average of 3 intermediate indicator values: Current Operating Margin, Past Operating Margins, and Future Operating Margins. This analysis assesses the developer's ability to deliver and operate a economically, financially, socially, and technically viable infrastructure project. An operating margin is defined as operating income (sales minus costs of products) as a percentage of revenues. Past and future trend analysis is evaluated for five to ten year backward and forward intervals.

As various industries have higher or lower standard operating margins, it is important to place the developer's current operating margin within the proper relative context.

The value assigned to the first intermediate indicator multiplied by ten corresponds to the percentile placement of the developer's operating margin relative to industry norms. For

example, a value of 9 would correspond to a developer operating margin in the 90th percentile. This developer's operating margin is better than 90% of his/her industry.

An analysis of the backward trend of operating margins is carried out for the second intermediate indicator.

Values between 7 - 10 reflect a moderately to substantially increasing past trend of developer operating margins. Such operating margins show the developer's historic strong and healthy financial performance and fiscal position. As revenue growth outpaces expenditure growth, cash reserves are augmented. A total increase in operating margins of 10% over five to ten years is considered a moderately increasing trend. A total increase in operating margins greater than 20% is considered a substantially increasing trend.

Values between 3 - 7 reflect a reasonably stabilized and level past trend of developer operating margins. Such operating margins show the developer's historic stable and conservative financial performance and fiscal position. Total variations in developer operating margins of plus or minus three percent over five to ten years constitute an indicator value of 5.

Values between 1 - 3 reflect a substantially to moderately decreasing past trend of developer operating margins. Such operating margins show the developer's historic declining financial performance and fiscal position. As expenses are increasing faster than revenues, cash reserves are being reduced. A total decrease in operating margins of 10% over five to ten years is considered a moderately decreasing trend. A total decrease in operating margins greater than 20% is considered a substantially decreasing trend.

An analysis of the forward trend of operating margins is carried out for the third intermediate indicator.

Values between 7 - 10 reflect a moderately to substantially increasing future trend of developer operating margins. Such operating margins show the developer's projected strong and healthy financial performance and fiscal position. As future revenue growth outpaces future expenditure growth, cash reserves are augmented. A total increase in operating margins of 10% over five to ten years is considered a moderately increasing trend. A total increase in operating margins greater than 20% is considered a substantially increasing trend.

Values between 3 - 7 reflect a reasonably stabilized and level future trend of developer operating margins. Such operating margins show the developer's projected stable and conservative financial performance and fiscal position. Total variations in developer operating margins of plus or minus three percent over five to ten years constitute an indicator value of 5.

Values between 1 - 3 reflect a substantially to moderately decreasing future trend of developer operating margins. Such operating margins show the developer's projected declining financial performance and fiscal position. As future expenses are increasing faster than future revenues, cash reserves are being reduced. A total decrease in operating margins of 10% over five to ten years is considered a moderately decreasing trend. A total decrease in operating margins greater than 20% is considered a substantially decreasing trend.

3.6 Factor 5: Developer Management Characteristics

A developer's sales position and operating efficiency are both affected by management priorities and procedures. As management largely determines a developer's future, its role toward the quality of a proposed infrastructure project is eminent. Empirical evidence of quality management of a firm (large scale) will translate into quality management of a project (small scale). Developer management indicators encompass: past performance, current dispute and control tools, and future planning.

Review of Factor 5 indicators: Past Performance, Current Control Tools, and Future Planning , provides an assessment of this contribution to overall infrastructure project quality.

Factor 5 score is determined from an average of its indicator values.

3.6.1 Indicator 12: Past Performance

Past performance is a key aspect of management assessment. It is described by percentage of achievement of earlier goals and percentage of meeting the finance, design, construction, and management obligations of past infrastructure projects.

Values between 7 - 10 represent an above-average industry success rate of setting and realizing related infrastructure project budget, time, and operational objectives.

Values between 3 - 7 represent an about-average industry success rate of setting and realizing related infrastructure project budget, time, and operational objectives.

Values between 1 - 3 represent a below-average industry success rate of setting and realizing related infrastructure project budget, time, and operational objectives.

3.6.2 Indicator 13: Current Control Tools

Current management controls for guiding the developer towards accomplishing current finance, design, construction, and management goals are also evaluated. Overcoming of status quo operational challenges is also studied.

Values between 7 - 10 represent an above-average industry application of leading project appraisal, budgeting, scheduling, cost engineering, and risk management paradigms and software as well as an above-average industry utilization of well-defined and current conflict

resolution procedures and arbitrations. Higher values characterize prolific use and teaching by developer staff of these project management techniques.

Values between 3 - 7 represent an about-average industry application of standard project management techniques. Normal and required use by management of standard budgeting and scheduling methods is evident. Common use of basic risk management and rudimentary project appraisal methods is also noticeable.

Values between 1 - 3 represent a below-average industry application of standard project management techniques. Basic use by management of budgeting and scheduling techniques is apparent.

3.6.3 Indicator 14: Future Planning

Future planning is another relevant priority of management. Considerations include: long-range planning regularity, frequency of plan checking and revising, and generation of plans and company objectives. Future plans regarding diversification, vertical integration, and technology development are stressed.

Values between 7 - 10 represent an above-average industry focus and management orientation toward future planning. Much attention is given to establishing future company goals, monitoring of progress toward achieving these goals, and revising of previously set goals. Commitments to broadening and deepening design, construction, and management expertise and practice and to furthering interdisciplinary cooperation are very obvious.

Values between 3 - 7 represent an about-average industry company commitment to future planning. Setting, tracking, and re-stating company goals is done periodically. Such plans include increasing knowledge and cooperation regarding and among fundamental disciplines: design, construction, and management.

Values between 1 - 3 represent a below-average industry orientation toward future planning. While future goals regarding diversification, discipline integration, and technological advancements are set, little definitive courses of action are planned and little effort is made to follow progress toward these objectives.

4. FINANCE SPECIFIC FACTORS

4.1 Finance Specific Factors Introduction

Finance specific factors detail the expected economic solvency of the proposed infrastructure project. In addition to projected revenues and expenditures, projected earnings stability, debt service, and financial leverage are also evaluated with regard to maintaining financial viability.

4.2 Factor 6: Financial Information Quality

Quality financial information is critical to the validity of financial figures estimating proposed infrastructure project revenues, expenditures, and debt service. Fair accounting procedures and sound and thorough studies are essential to accurately forecast financial data. Indicators are normality of accounting practices and depth of financial studies.

Factor 6 indicators: Normality of Accounting Practices and Depth of Financial Studies, examine the soundness and fairness of these criteria.

As the provided financial information will be used to calculate the financial ratios required in subsequent factors, the quality of this information is critical to overall infrastructure project quality. Financial analysis of a proposed infrastructure project can be skewed by the quality of financial data. Factor 6 score is determined from an average of its indicator values.

4.2.1 Indicator 15: Normality of Accounting Practices

Various accounting methods may exaggerate the projected financial performance and position of infrastructure development. Comparisons to industry accounting norms will ascertain if the accounting schemes used overstate or understate the numbers and ratios.

Values between 7 - 10 represent accepted industry accounting practices. Financial figures are not misrepresented.

Values between 3 - 7 represent those accounting practices that are still accepted industry-wide in spite of their over-stating or under-stating of certain financial figures.

Values between 1 - 3 represent inaccurate financial data.

4.2.2 Indicator 16: Depth of Demand Studies

Of additional importance to proposed infrastructure projects is the degree of validity and thoroughness of the studies which support the estimated earnings, expenditures figures, and debt service projections. These socioeconomic studies are the basis for the financial figures for the infrastructure project. As such, they are important to representing quantification of the advantages of private sector involvement.

Values between 7 - 10 represent an above-average industry level of thoroughness and detail in the demand studies used to forecast project financial information. Use of highly reputable and highly knowledgeable consultants for demand forecasts and project expenditure estimation is evident. Elements to a reliable feasibility study include growth projections, elasticity quantification, and capacity constraints.

Values between 3 - 7 represent an average industry level of thoroughness and detail in the demand studies used to forecast project financial information. Project feasibility studies outline project earnings and expenditures. Demand forecast specialists are also used.

Values between 1 - 3 represent a below-average industry level of thoroughness and detail in the demand studies used to forecast project financial information. Basic and rough estimates for project earnings and expenditures are used.

4.3 FACTOR 7: PROJECTED EARNINGS STABILITY

Beyond projected earnings, the stability of these earnings is of critical importance to the project's quality. Sustained or increasing earnings are a definitive measure of project outcome. Evaluation of earnings focuses on measurements which clarify the long-term earning power of the proposed infrastructure project. Two measurements can be calculated. These represent earnings stability indicators.

Long-term economic power is measured by tracking the operating income as a percent of revenues and return percentage on invested capital over a suitable duration of project service life. To place these ratios within a relative positioning, comparison with the same ratios for alternative technologies or different service providers is done. Also important to consider are the degree of diversification of the revenue stream. These aspects go toward further qualifying of the source and stability of earnings.

Trends in projected earning power and earnings coverage ratios are of particular relevance. A prospective increasing trend is beneficial.

Factor 7 indicators: Operating Margins and Return on Capital, examine the infrastructure development's long-term earning power, a critical measure of earnings stability.

Factor 7 score is determined from an average of its indicator values.

4.3.1 Indicator 17: Operating Margins

Operating margins are expressed as operating income, sales minus cost of goods / services provided, divided by sales.

Calculation of operating margins can be done for each year of the infrastructure project service life. The lowest financial percentage can then be expressed in terms of an indicator value by using Figure 9. (See Section 4.7 for additional explanation.)

This initial indicator value serves as a basis point for further indicator value adjustment. Additional considerations include relative industry comparison (up to plus or minus one point), degree of revenue stream diversification (up to plus or minus one point), and trend of operating margins (up to plus or minus one point).

4.3.2 Indicator 18: Return on Capital

Indicator 18: Return on Capital

Return on capital is expressed as pretax income divided by the sum of total long-term and short-term debt.

Calculation of return on capital can be done for each year of the infrastructure project service life. The lowest financial percentage can then be expressed in terms of an indicator value by using Figure 10. (See Section 4.7 for additional explanation.)

This initial indicator value serves as a basis point for further indicator value adjustment. Additional considerations include relative industry comparison (up to plus or minus one point) and trend of return on capital figures (up to plus or minus one point).

4.4 FACTOR 8: DEBT COVERAGE ADEQUACY

Timely and full repayment of principal and interest critically affects the quality of a proposed infrastructure project. Proof of solid debt coverage is necessary during the development phase to attract capital investors and necessary at the operational phase to ensure against

default, resulting in loss of infrastructure service and product. Indicators include the debt service ratio for the duration of project operation, the debt service schedule, and the existence of a debt service reserve.

A measurement of the impact of these criterion on the infrastructure development's total viability is accomplished by reviewing Factor 8 indicators: Debt Service Ratio, Debt Service Schedule, and Debt Service Reserve.

Factor 8 score is determined from an average of its indicator values.

4.4.1 Indicator 19: Debt Service Ratio

The debt service ratio quantifies the project's ability to repay principal and interest over the project duration. Cash availability is essential to pay both daily operational costs and principal and interest when due. The debt service ratio measures the extent to which projected cash on hand can meet these expenses.

Debt service ratio is expressed as funds from operations (net income) divided by total debt.

Calculation of debt service ratios can be done for each year of the infrastructure project service life. The lowest financial ratio can then be expressed in terms of an indicator value by using Figure 11. (See Section 4.7 for additional explanation.)

This indicator value is taken as final as other debt considerations are addressed in the following indicators.

4.4.2 Indicator 20: Debt Service Schedule

The debt service schedule indicates the increasing, stable, or decreasing level of debt repayment expected until maturity. Such repayment levels should follow earnings projections.

Values between 5 - 10 describe an overall slightly to significantly accommodating debt service schedule. Of particular importance is the duration of and magnitude of lowered debt service requirements. These lowered debt service requirements attempt to mitigate the effects of the project's ramp-up period. A ramp-up period is the initial operating phase of an infrastructure project. The first few years of operation are most critical for infrastructure projects. These years are characterized by breaking in of operations and slowly adjusting service area demand. As such, earning are usually lower than expected and slow to increase to expected values. Higher indicator values will not underestimate the duration and financial effects of the ramp-up period. Further, lowered initial debt service requirements for such an extended period must be compensated by a debt service schedule which starts steeply ascending near the middle of the infrastructure project's service life. In addition, debt service schedule requirements should also roughly follow earnings projections (up to plus or minus one point).

Values between 1 - 5 describe a significantly to slightly unaccommodating debt service schedule. Lower indicator values are associated with a constant debt service requirement with no accommodation for ramp-up period effects. Values closer to 5 are associated with a debt service schedule that strictly follows earnings projections.

4.4.3 Indicator 21: Debt Service Reserve

A debt service reserve account measures the degree of protection afforded to repayment in the event that earnings projections are not met. It can be used to repay debt during temporary difficulties with the project. For instance, a strike at the project may shut down the project and result in an interruption of service and revenue generation. In another case, timing

problems in collecting revenues may expose the project to a temporary shortage of funds. A sizable debt service reserve account can mitigate these types of risks.

Values between 7 - 10 reflect a moderate to substantial debt reserve account balance. For these values, debt reserve requirements exceed 1.5 times annual debt service.

Values between 3 - 7 reflect a reasonable debt reserve account balance. For these values, debt reserve requirements are between 0.5 to 1.5 times annual debt service.

Values between 1 - 3 reflect an inadequate debt reserve account balance. For these values, debt reserve account balance is below 0.5 times annual debt service.

4.5 Factor 9: Financial Leverage

Infrastructure project quality is also affected by the degree of project financial leverage. While capital structure is different for each project, in general, higher risk projects require higher equity participation. The debt-to-equity ratio impacts debt service coverage ratios and also depicts the developer's level of commitment to the infrastructure project. Highly leveraged projects are more susceptible to compromising of debt repayment and operating expenses as a result of lean economic cycles in which assets may be devalued and cash flows decreased. Pay down of borrowed funds will be more difficult for infrastructure developments which have maximized their financial leverage. The extent to which a developer uses outside funds to pay initial capitalization costs is assessed by examining this factor's indicator which expresses long-term debt as a percent of capitalization.

From evaluation of this indicator, the degree of financial leverage for a proposed infrastructure project can be ascertained.

Factor 9 score is determined directly from its indicator value.

4.5.1 Indicator 22: Long-term Debt to Capitalization

The ratio is expressed as long-term debt divided by total capitalization.

Calculation of long-term debt as a percentage of capitalization can be done for each year of the infrastructure project service life. The highest financial percentage can then be expressed in terms of an indicator value by using Figure 12. (See Section 4.7 for additional explanation.)

This initial indicator value serves as a basis point for further indicator value adjustment. Additional considerations include relative industry comparison (up to plus or minus one point), trend of leverage (up to plus or minus one point), timing of equity infusions (up to plus or minus one point), and necessity or forecasted need for back-up equity contributions (up to plus or minus one point).

4.6 Factor 10: Financial Flexibility

For any project and especially for the initial capital intensive and high volume infrastructure industry, financial flexibility over the project's service life is of paramount importance. Accordingly, factor 10 is premised upon this high level of significance accorded to financial flexibility. It is a redundant qualification which purports to add significance to financial flexibility.

Financial flexibility can be measured in terms of economic health by assessing projected earnings stability ratios, debt coverage ratios, and the financial leverage ratio in combination. Other considerations encompass developer financial options during economic stress: ability to utilize short-term debt, to refinance long-term debt, and to generate cash inflows from sale

of assets or investments. Existence of a sizable undesignated reserve fund or back-up equity commitments is also ideal.

High flexibility is characterized by sustained cash flow with adequate earnings and debt coverage ratios. Also helpful to financial flexibility are longer term debts with evenly spaced maturities[8].

Because financial flexibility measures the proposed infrastructure development's ability to sustain economic duress in the from of unmet revenue forecasts or downturns in demand, it is an eminent criteria for quality evaluation. Factor 10 score is determined directly from its indicator value.

4.6.1 Indicator 23: Composite Evaluation of Basic Financial Ratios

A value for initial assessment can be calculated from an average of Factor 7, Factor 8, and Factor 9 values. Additional evaluation includes: ease of access to short term capital markets (up to plus or minus one point), ability to refinance long-term debt (up to plus or minus one point), potential for realizing cash inflows from asset sales and investment sales (up to plus or minus one point), and existence of a reasonable undesignated reserve fund (up to plus or minus two points).

4.7 Financial Scaling Basis

The following indicators: Indicator 17: Operating Margins, Indicator 18: Return on Capital, Indicator 19: Debt Service Ratio, and Indicator 22: Long-term Debt to Capitalization represent financial figures commonly used in credit rating agencies' financial analysis. Evaluation of these four financial figures constitutes 50% - 70% of a Standard and Poor's

[8] Standard and Poor's 1986.

Bond Credit Rating[9]. These financial data are directly related to the overall bond rating. Each bond rating can be expressed in terms of these four basic and critical Standard and Poor's financial figures. Figure 6 summarizes Standard and Poor's Key Ratio Medians for various bond ratings.

For the IPQAM's purposes, indicator values serve as a measure of these financial ratios. Indicator values or intervals can be set to corresponding Standard and Poor's bond ratings. Higher indicator values correlate to higher bond ratings. Figure 7 shows these relationships.

This association of indicator values with Standard and Poor's bond ratings facilitates expression of indicator values in terms of Standard and Poor's Key Ratio Medians (See Figure 8). Indicator values for each of the four Key Ratio Medians can be determined. X-Y plots depict the indicator values associated with their respective financial ratios. Figure 9 expresses indicator values in terms of Standard and Poor's Operating Margins. Figure 10 represents indicator values in terms of Standard and Poor's Return on Capital. Figure 11 shows indicator values for Standard and Poor's Debt Service Ratios. Figure 12 defines indicator values for Standard and Poor's Long-term Debt to Capitalization.

These Key Ratio Medians provide an initial indicator value from which to base further analysis and indicator value adjustments.

Standard and Poor's							
Key Ratio Medians (1983-1985)							
	AAA	**AA**	**A**	**BBB**	**BB**	**B**	**CCC**
Operating income / sales (%)	18.67	15.20	11.73	10.18	10.90	8.83	10.50
Pretax return on permanent capital (%)	25.60	22.05	18.03	12.10	13.80	12.01	2.70
Funds from operations / total debt (%)	151.40	84.31	60.73	39.44	23.28	16.88	8.12
Long-term debt / capitalization (%)	8.85	18.88	24.46	31.54	42.52	52.04	69.28

Figure 6. Standard and Poor's Key Ratio Medians for 1983-1985 Industrial Bond Ratings

[9] Hawkins 1983.

Standard and Poor's Bond Ratings	INFRATEST Indicator Values
AAA	9 - 10
AA	7 - 9
A	6 - 7
BBB	5 - 6
BB	4 - 5
B	2 - 4
CCC	1 - 2

Figure 7. Standard and Poor's Bond Ratings Related to INFRATEST Indicator Values

Indicator Values	Plotted Indicator Value	Operating income / sales (%)	Pretax return on permanent capital (%)	Funds from operations / total debt (%)	Long-term debt / capitalization (%)
9 - 10	10	18.67	25.60	151.40	8.85
7 - 9	8	15.2	22.05	84.31	18.88
6 - 7	6.5	11.73	18.03	60.73	24.46
5 - 6	5.5	10.18	12.1	39.44	31.54
4 - 5	4.5	10.9	13.8	23.28	42.52
2 - 4	3	8.83	12.01	16.88	52.04
1 - 2	1.5	10.5	2.7	8.12	69.28

Figure 8. Correlated Indicator Values to Standard and Poor's Key Ratio Medians

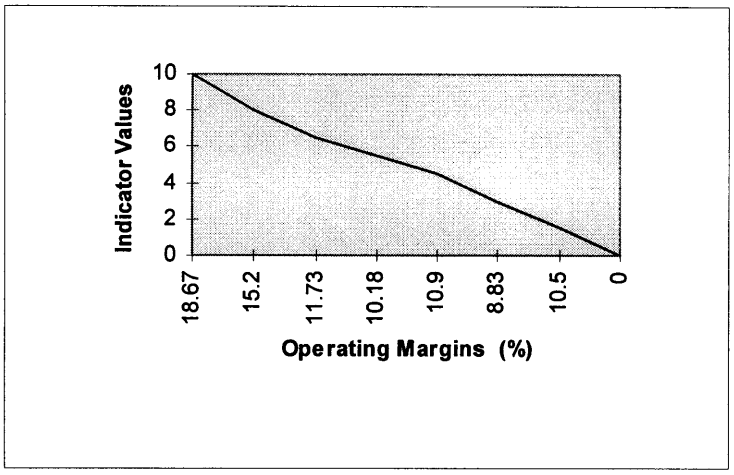

Figure 9. Indicator Values in terms of Operating Margins

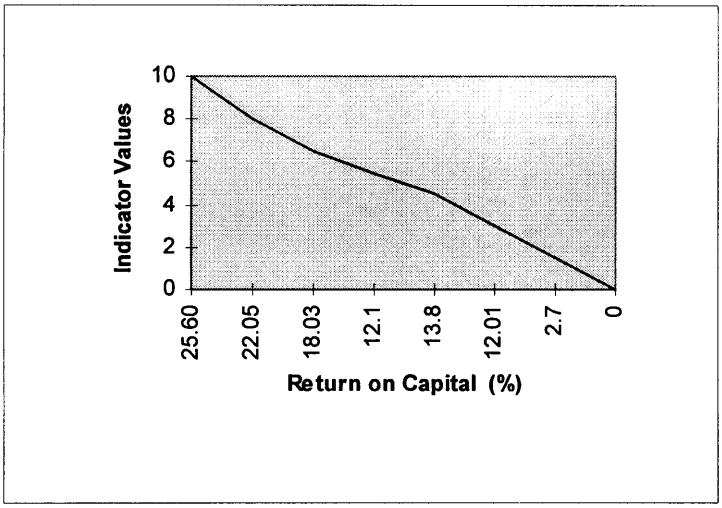

Figure 10. Indicator Values in terms of Return on Capital

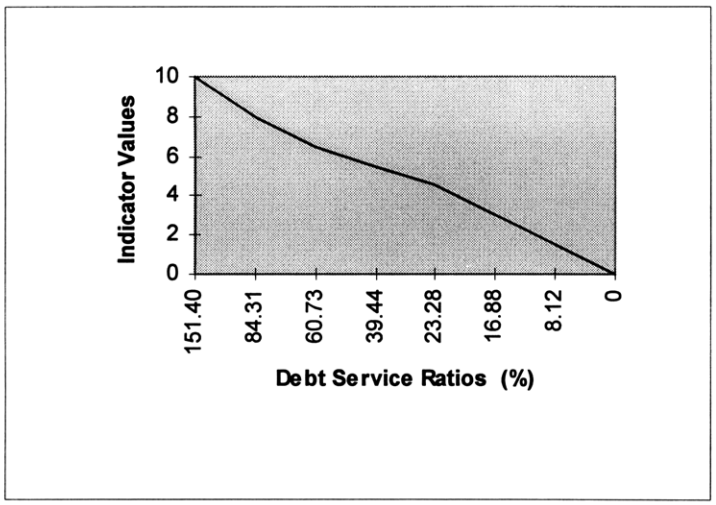

Figure 11. Indicator Values in terms Debt Service Ratios

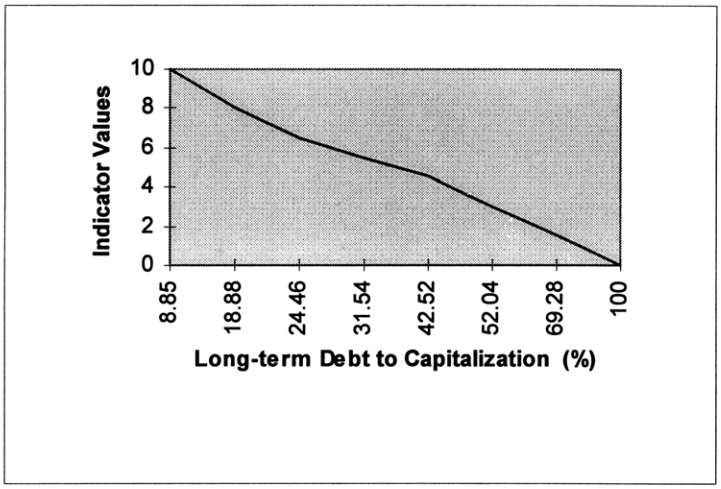

Figure 12. Indicator Values in terms of Long-term Debt to Capitalization

5. PROJECT SPECIFIC FACTORS

5.1 Project Specific Factors Introduction

Project specific factors examine those aspects of project quality unique to a particular proposed infrastructure development. Inherent characteristics such as financing package, contractual risks, environmental and technological advances in construction and design, and operating efficiency are qualitatively measured.

5.2 Factor 11: Financing Package

As the terms of a bond indenture are important to a bond rating, the financing package of the infrastructure project is of critical worth. Rating of the financial package involves the degree of recourse of the project, the creditworthiness of the developer, and financing mechanisms utilized singly or in combination.

Factor 11 indicators: Financial Recourse, Creditworthiness of Developer, and Financing Mechanism, quantify the effect of these criteria.

The terms of a proposed infrastructure development's financing package are important toward assessing overall project quality. Adequate collateralization terms and a workable financing scheme are essential to a viable project. Factor 11 score is determined from an average of its indicator values.

5.2.1 Indicator 24: Financial Recourse

Degree of recourse represents the first indicator for finance package evaluation. Extent of recourse can vary from non-recourse to credit supported / recourse. For non-recourse financings, project cash flow is the only method for debt repayment. For credit supported /

recourse financings, the developer is held legally bound to ensure prompt and complete debt service in the event of cash flow inadequacies. Combinations of several guarantees and joint guarantees represent common types of credit support. In other cases, developers may have economic, political, or business incentives to ensure prompt and complete debt service although no legal obligation to do so exists.

Values between 7 - 10 represent full collateral supported and/or credit supported recourse financings. Higher values are associated with several guarantees (credit or collateral supported) involving all infrastructure project participants. Lower values are associated with a combination of several guarantees and joint guarantees among infrastructure participants.

Values between 3 - 7 represent either recourse financings with joint guarantees among infrastructure project participants or non-recourse financings where the developers will be motivated by external, non-legal influences to service debt. Higher values are associated with those developers who are motivated by political or business influences to service debt fully and promptly.

Values between 1 - 3 represent non-recourse financings in which developers have no non-legal motivations to service debt.

5.2.2 Indicator 25: Creditworthiness of Developer

Creditworthiness of the developer is another indicator of finance package quality. Of importance is the credit standing of the developer: his ability to manage economically sound and rational projects and his ability to take on the legal obligations to repay project debt in the event of a cash shortfall. Developer commitment to the proposed infrastructure project is confirmed by his quantity of resources and time invested. Significant commitments of equity investment from the developer are considered positive and enhancing toward overall project quality. Additionally, the strategic importance of the infrastructure project to the developer also factors into his initiative to finance a project to completion.

Values between 7 - 10 describe developers characterized by a strong ability to repay project debt in the likelihood of income shortfall or total project default. Other attributes include a disproportionate significance between project debt obligations and consequences of allowing project default. Higher values are associated with those projects where the financial obligations of the project are small in comparison to the economic damage that the developer will sustain from allowing default. Covering of project debt would not pose a significant financial stress to said developer. However, damage to credit profile is significant if the proposed infrastructure project is allowed to default.

Values between 3 - 7 describe developers characterized by an adequate ability to repay project debt in the likelihood of an income shortfall or total project default. However, such a financial obligation would pose a financial stress to said developer.

Values between 1 - 3 describe developers characterized by an inadequate ability to repay project debt. Higher values reflect developer ability to cover partial debt repayment. Lower values are associated with developer's which possess no credit or external motivation to service debt in the event of project default.

5.2.3 Indicator 26: Finance Mechanism

The last financing package indicator is the actual finance mechanisms used singly or in combination. Revenue or industrial bonds, commercial bank mortgages, and/or financial institution loans are common finance vehicles. Each financing scheme affects the cost of borrowing capital differently. Other variables include equity percentage, terms of repayment, and term of loans. In some projects, the developer may be using numerous sources of funding. This funding may be used at different times. Additionally, back-up cash infusions may also be lined up in the event that various sources of funding do not materialize or in the event that contingency funding is necessary.

Indicator values are related to interest rates prescribed based on financing mechanism utilized. Higher values are associated with financing mechanisms which possess lower interest rates. Suggested indicator values are as follows: Government Grants == 9 - 10, Tax-Exempt Revenue Bonds == 7 - 9, Revenue Bonds == 5 - 7, Commercial Bank Loans == 3 - 5, and Financial Institution Loans == 1-3.

Additional considerations entail a definitive commitment of funds (up to plus or minus 2 points) and availability of replacement or contingency funding (up to plus or minus 2 points).

Further, for government grants include the attachment of deleterious regulations or project requirements which hinder project development (up to minus 5 points).

5.3 Factor 12: Completion Risks

Each stage of an infrastructure project contains risks that threaten the completion of the undertaking. Mitigation and allocation of these risks during the development and construction stage is of utmost concern in determining infrastructure project quality. Quality projects will have minimized completion risks. Indicators include development stage risks and delivery stage risks.

Review of Factor 12 indicators: Development Phase Risks and Delivery Phase Risks, leads to a measurement of the relationship between completion risks and overall infrastructure project quality.

Factor 12 score is determined from an average of its indicator values.

5.3.1 Indicator 27: Development Phase Risks

Development phase risks include right-of-way acquisition, power of eminent domain, environmental permitting, political consensus, and community acceptance.

Values between 7 - 10 represent effective elimination of significant development phase risks. Development phase risks have been successfully mitigated, transferred through contracts, or have been risk financed through insurance and contingency reserves.

Values between 3 - 7 represent effective elimination of some to most significant development phase risks. Remaining risks are being reduced, contractually transferred, or risk financed.

Values between 1 - 3 represent full exposure to most development phase risks. Significant delay of project is certain to occur.

5.3.2 Indicator 28: Delivery Phase Risks

Delivery phase risks include a construction contract which encourages timely and on-budget completion of the project, stipulates proper insurance coverage, handles internal and external dispute resolution, secures efficient scheduling for equipment delivery, installation, and start-up operation, and deals with force majeure events. Additionally, the type of project delivery system used can increase or decrease delivery phase risks.

Values between 7 - 10 represent effective elimination of significant delivery phase risks. Delivery phase risks are successfully transferred through contracts or have been risk financed through insurance and contingency reserves. Project delivery system works to enhance risk mitigation.

Values between 3 - 7 represent effective elimination of some to most significant delivery phase risks. Remaining risks are being reduced, contractually transferred, or risk financed.

Values between 1 - 3 represent full exposure to most delivery phase risks. Significant delay of project is certain to occur. Project delivery system works against risk mitigation.

5.4 Factor 13: Regulatory Climate

An infrastructure project's regulatory climate is characterized by the financial effect of the regulatory commission's policies and procedures. Beyond financial health, a regulatory commission's mandates can also impact environmental issues, safety, and facilities siting as well as securities sales. However, these issues are not only difficult to qualify, but their effects are elusive and dominated by financial impacts. Exceptions can be made for individual infrastructure projects.

As the regulatory commission will set the rates charged to the consumer for the infrastructure project outputs, the ability of the private market developer to negotiate a realistic range of base rates according to free market demand and supply and profit motivations is the sole indicator for Factor 13.

Regulatory climate is key to a proposed infrastructure project's realization of full private enterprise advantages. Factor 13 score is determined directly from its indicator value.

5.4.1 Indicator 29: Developer Power to Set Rates

The extent to which a private developer can negotiate a range of base rates and determine rate increases for proposed infrastructure project services and products represents an indicator of regulatory climate. This is evaluated in relation to the power of a public authority to set these rates and rate increases.

Values between 5 - 10 represent the developer successfully negotiating pricing of infrastructure project outputs / services. Higher values are associated with a completely free

enterprise setting with profit margins only limited by demand and supply. Lower values are associated with prices being limited by imposed standard industry profit levels.

Values between 1 - 5 represent the developer having no control to little control over pricing of infrastructure project outputs / services. Lower values are associated with an absence of free enterprise influence with regard to pricing.

5.5 Factor 14: Project Environmental Merits

Overall infrastructure project quality is influenced by environmental considerations utilized in the design and construction phase. Considerations entail compliance with necessary environmental standards in design and operation of infrastructure project and minimization of environmental impacts during construction of infrastructure project and during operation of infrastructure project for entire service life. EPA requirements, wetland studies, hazardous waste disposal, and site remediation studies are all critical. Of additional importance are the public's perception of these environmental issues and impacts.

Commitment to such environmental considerations throughout project design, construction, and operation is the indicator for Factor 14.

Factor 14 score is determined directly from its indicator value.

5.5.1 Indicator 30: Commitment to Environmental Considerations

Values between 7 - 10 represent developer commitments to both environmental standards and environmental preservation measures above and beyond standard industry norms. Higher values are associated with meeting far stricter future environmental requirements and application of inspired designs which lessen environmental disruption.

Values between 3 - 7 represent developer commitment to both environmental standards and environmental preservation measures in accordance with standard industry norms. Little additional effort in design, construction, and operation is expended to surpass normal environmental standards.

Values between 1 -3 represent developer commitment to both environmental standards and environmental preservation measures below standard industry norms. Environmental permitting and inspection passing may be problematic.

This indicator value is adjusted based on the public's perception of the project environmental commitments: positive public perceptions (up to plus 2 points) and negative public perceptions (up to minus 2 points).

5.6 Factor 15: Project Technology Merits

Overall infrastructure project quality is also influenced by technical advances applied in the design and construction phase. These advances improve material performance, structural loading, construction, and mechanical efficiency. Such advances can be measured relative to industry standards in terms of general performance specifications.

Factor 15 score is determined directly from its indicator value.

5.6.1 Indicator 31: Commitment to Technology Advances

Values between 7 - 10 represent above and beyond industry developer commitments to advanced technology in design, construction, and operation of the infrastructure. Higher values are associated with designs which incorporate advanced construction materials, technically advanced structural systems, and technically advanced operations apparatus.

Values between 3 - 7 represent standard industry developer commitments to advanced technology in design, construction, and operation of the infrastructure project. For large-scale infrastructure projects this has consistently meant minimal application of new technology in design. Tried and true technologies are applied through all project phases.

Values between 1 -3 represent below standard industry developer commitments to advanced technology in design, construction, and operation of the infrastructure project. Obsolete technology is employed.

6. INFRATEST RESULTS

6.1 PRESENTATION OF INFRATEST RESULTS

INFRATEST exists as a basic methodology for simplification of the subjective and complex aspects which comprise infrastructure project quality rating. It serves as an efficient and straightforward way to organize and evaluate the multitude of interrelated factors which affect infrastructure project quality assessment. In practice, it serves private developers and public entities in packaging projects for capital market finance and possible private sector investment. Presentation of INFRATEST results further emulates such objectives of efficiency and straightforwardness. Bar graphs and pie charts are utilized for their ability to easily and clearly portray indicator values and factor scores.

Figure 13 shows sample INFRATEST Indicator results.

Figure 14 depicts indicator values. Each indicator corresponds to a certain indicator number. Indicator values are represented with bars of appropriate length. Such indicator values range from one to ten. As each indicator is illustrated as a discrete element, the relative value of each indicator is visually ascertained. Each bar represents a relevant component of infrastructure project quality. Adjustments to individual indicators can be clearly shown.

Figure 15 also shows indicator values. In addition, the line represents a desired indicator project profile. An indicator project profile is composed of the minimum indicator values necessary for project privatization consideration. An indicator project profile can be determined by a constant indicator value for all indicators. This would be represented by a line with constant zero slope with a y-intercept at the specified constant indicator value. Alternatively, an indicator project profile can also be determined by varying indicator values for different indicators. This would be represented by a line with varying positive and negative slopes, passing through the various specified indicator values at related indicator numbers. These indicator project profiles allow for specific calibration of the quality

criterion to individual developer requirements or infrastructure industry particulars. Each developer can stipulate his/her unique minimum required indicator values.

Figure 16 shows sample INFRATEST factor results.

Figure 17 portrays the factor scores. Each factor is associated with a specific factor number. Factor scores are shown with bars of appropriate height. Such factor scores are averages of the corresponding indicator values and range from one to ten. Similar to indicator values, the discrete and separate nature of factor scores is particularly suited for bar graph representation. The relative contribution to overall infrastructure project quality of each factor can be seen; adjustments to single factors can be easily illustrated.

Figure 18 depicts factor values and a desired factor project profile. Similar to a desired indicator project profile, minimum factor scores for project privatization approval constitute a desired factor project profile. Factor score requirements can also be tailored to individual developer business, resource, and network potential. Such specialization also ensures a minimum quality threshold unique to each infrastructure industry.

Figure 19 summarizes sample INFRATEST specific factor percentiles and their relevant factor contributions.

Figure 20 represents the composition of the business, finance, and project specific factor scores. Each of these specific factor scores is ascertained by summing the relevant factor scores. Each specific factor score is composed of five factor scores and ranges from one to fifty. Each shade represents the contribution of a single factor to the overall specific factor score. Individual factor score contribution and the relative score of each specific factor is thus easily visualized. Further, the affect of individual indicator value and factor score changes can be visually appreciated.

For the Business Specific Factor score (specific factor number 1), gray corresponds to the contribution from Factor 1: Infrastructure Market Constitution, dark gray corresponds to the contribution from Factor 2: Service Territory Demand, light ash corresponds to the contribution from Factor 3: Developer Infrastructure Industry Experience, dark ash corresponds to the contribution from Factor 4: Developer Industry Position, and black corresponds to the contribution from Factor 5: Developer Management Characteristics.

For the Finance Specific Factor score (specific factor number 2), gray corresponds to the contribution from Factor 6: Financial Information Quality, dark gray corresponds to the contribution from Factor 7: Projected Earnings Stability, light ash corresponds to the contribution from Factor 8: Debt Coverage Adequacy, dark ash corresponds to the contribution from Factor 9: Financial Leverage, and black corresponds to the contribution from Factor 10: Financial Flexibility.

For the Project Specific Factor score (specific factor number 3), gray corresponds to the contribution from Factor 11: Financing Package, dark gray corresponds to the contribution from Factor 12: Completion Risk, light ash corresponds to the contribution from Factor 13: Regulatory Climate, dark ash corresponds to the contribution from Factor 14: Project Environmental Merits, and black corresponds to the contribution from Factor 15: Project Technology Merits.

Figure 21 thru Figure 24 shows the percentage contribution of each relevant factor to their specific factors' composition. Each individual score can thus be measured in terms of the scores from the other four relevant factors. Visual representation of adjustments to particular factor scores is also achieved. Overall percentile placement of the specific factor is also depicted.

Figure 25 summarizes the sample INFRATEST overall project quality rating.

Figure 26 illustrates the specific factor components of the overall project quality rating. The overall project quality rating is calculated by summing the specific factor scores. As each specific factor score ranges from one to fifty, the overall project quality rating ranges from one to one hundred and fifty. Each shade represents the contribution of a specific factor score to the overall quality rating. The elemental composition of the overall project quality rating is thus seen. The affect of specific factor score changes can also be clearly portrayed.

Light gray corresponds to the contribution from the business specific factor score, dark gray corresponds to the contribution from the finance specific score, and light ash corresponds to the contribution from the project specific factor score.

Figure 27 and Figure 28 depict the percentage components of each specific factor score comprising the overall project quality rating. As such, the overall project quality rating percentile is graphically represented as the summation of the percentage contributions of the specific factor scores. Contribution comparisons and the influence of specific factor score changes can also be visualized.

6.2 Interpretation of INFRATEST Results

INFRATEST's overall infrastructure project quality rating reflects equal consideration of business, finance, and project criterion. Status quo efforts to rate privatized infrastructure developments have been limited to public enterprise revenue-backed infrastructure projects. Analysis has focused on the traditional bond rating financial ratio assessments with limited additional focus on qualitative marketplace aspects. INFRATEST maintains this conservative and stringent financial scrutiny common to the major bond rating agencies, but goes beyond these aspects of financial viability to also address business and project specific rationales. From an engineer's or a developer's perspective, such business and project specific issues are critical to evaluating infrastructure project quality in the realm of private enterprise influences. Analysis of the viability of private investment in public infrastructure requires increased attention to infrastructure industry, service territory demand, developer

strengths and weaknesses, and specific project finance, regulatory, constructability, environmental, and technology tenants. INFRATEST ratings reflect this increased focus on business and project criterion in addition to the traditional focus on strict financial evaluation.

INFRATEST results can be interpreted in two different ways.

First, individual indicator values or individual factor scores can be evaluated against a desired indicator project profile or a desired factor project profile. These INFRATEST benchmark standards can be used to assess private investment potential according to the degree that project indicators and factors fail, meet, or exceed desired project profile values or scores. Such project profiles can be established to reflect the various business, financial, and project requirements and expectations of private investors in capital markets. For a private developer consortium facing a plethora of various infrastructure project proposals, application of INFRATEST analysis and setting of INFRATEST benchmark project profiles will enable efficient and effective sorting of these projects per capital market potential. From this preliminary assessment of financial market feasibility, as measured through business, finance, and technical aspects, transaction costs can be saved by submitting only the most promising projects to capital market institutions.

In general, indicator values and factor scores between 7 - 10 reflect a slightly to extremely above-average market, developer, financial, or project quality. Such ratings strongly merit private investment in the specific infrastructure project.

Indicator values and factor scores between 3 - 7 reflect an about-average market, developer, financial, or project quality. Such ratings marginally merit private investment in the specific infrastructure project. Potential for privatization can go either way: privatize or remain under public sector influences.

Indicator values and factor scores between 1-3 reflect a below-average market, developer, financial, or project quality. Such ratings strongly discourage private investment in the specific infrastructure project.

The second interpretation of INFRATEST's results is as follows. Business, finance, and project specific factor and the overall project quality rating percentiles can be used to prioritize a portfolio of proposed infrastructure projects. This prioritization encompasses an infrastructure project's business, financial, and project viability under private market influences with private capital backing. Projects with higher percentile ratings possess a higher potential for successful entry into the infrastructure privatization arena. For a public entity facing numerous public infrastructure demands, INFRATEST's overall project quality rating percentiles can be used to prioritize proposed infrastructure projects with respect to private sector viability, enabling determination of which way to develop each project: in the public sector or in the private sector. In this way, scarce public resources will be efficiently allocated toward those projects which have minimal private sector feasibility. Other projects which possess private sector benefits and appeal, can be thus packaged for private sector development.

In general, factor specific and overall project quality percentile ratings between 70% - 100% reflect an economic, financial, or project specific or overall project outlook characterized by current and sustainable high levels of business, financial, and/or project quality in the face of private enterprise fluctuations. Such quality can be defined in terms of infrastructure industry, market, developer attributes, financial, and project aspects. These infrastructure projects promise financial and social rewards if brought into the private sector. Such benefits are secured by the high quality of individual indicator values and thus high quality factor scores.

Factor specific and overall project quality percentile ratings between 30% - 70% reflect an economic, financial, or project specific or overall project outlook characterized by moderate levels of business, financial, and/or project quality amidst private enterprise influences. The

decision to privatize is not clear either way, overall project quality is essentially balanced out by enhancing and detrimental effects. At best, the economic rewards of these projects are adequate, but risk-ridden. At worst, economic rewards will not be realized and marginal financial losses may be incurred.

Factor specific and overall project quality percentile ratings between 1% - 30% reflect an economic, financial, or project specific or overall project outlook characterized by low levels of business, financial, and/or project quality with respect to the changing environment of private enterprise. Privatization of such projects is not advised.

Indictor Name	Indicator Number	Indicator Value	Indicator Value Required
Growth Phase	1	8.5	7.0
Economic Effects	2	7.0	7.0
Resource Effects	3	8.0	7.0
Demand Forecasts	4	9.0	7.0
Socioeconomics of Service Area	5	9.0	7.0
Infrastructure Network Position	6	7.5	7.0
Engineering Experience	7	7.0	7.0
Construction Experience	8	6.5	7.0
Operations Experience	9	8.5	7.0
Sales Position Trends	10	7.0	7.0
Operating Margin Trends	11	5.5	7.0
Past Performance	12	4.5	7.0
Current Control Tools	13	6.5	7.0
Future Planning	14	7.0	7.0
Normality of Accounting Practices	15	9.0	7.0
Depth of Demand Studies	16	9.5	7.0
Operating Margins	17	8.5	7.0
Return on Capital	18	6.5	7.0
Debt Service Ratio	19	8.5	7.0
Debt Service Schedule	20	9.5	7.0
Debt Service Reserve	21	10.0	7.0
Long-term Debt to Capitalization	22	4.5	7.0
Composite Evaluation of Financial Ratios	23	8.0	7.0
Financial Recourse	24	9.0	7.0
Creditworthiness of Developer	25	7.0	7.0
Finance Mechanism	26	8.0	7.0
Development Phase Risks	27	10.0	7.0
Delivery Phase Risks	28	7.5	7.0
Developer Power to Set Rates	29	9.0	7.0
Commitment to Environmental Considerations	30	8.0	7.0
Commitment to Technology Advances	31	9.0	7.0

Figure 13. Sample INFRATEST Indicator Results

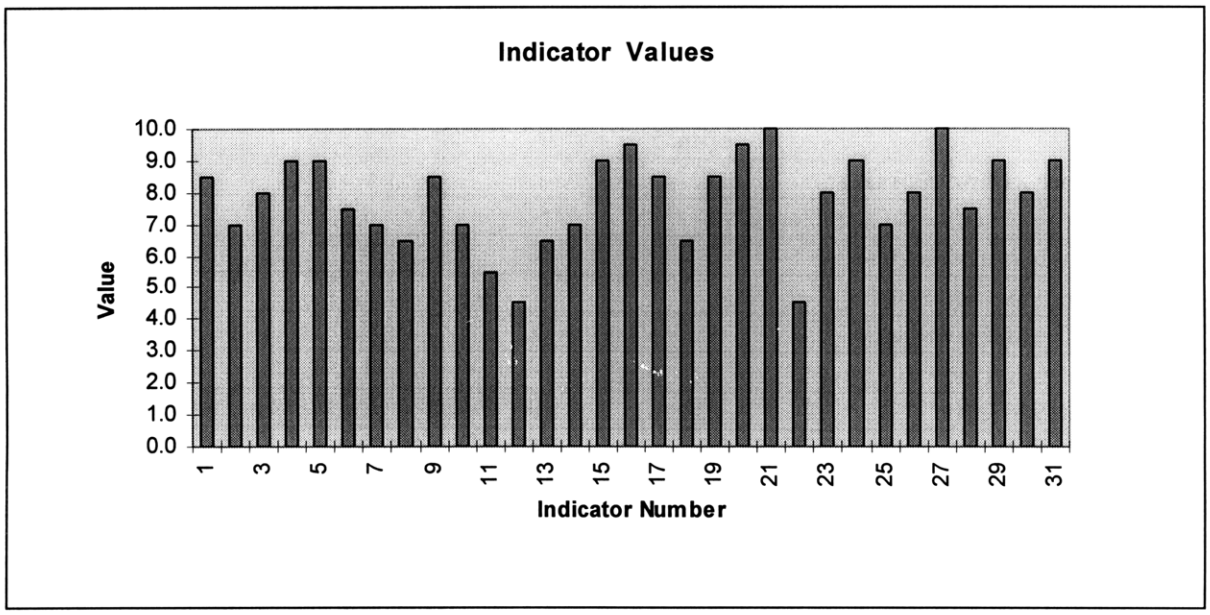

Figure 14. Sample INFRATEST Indicator Values

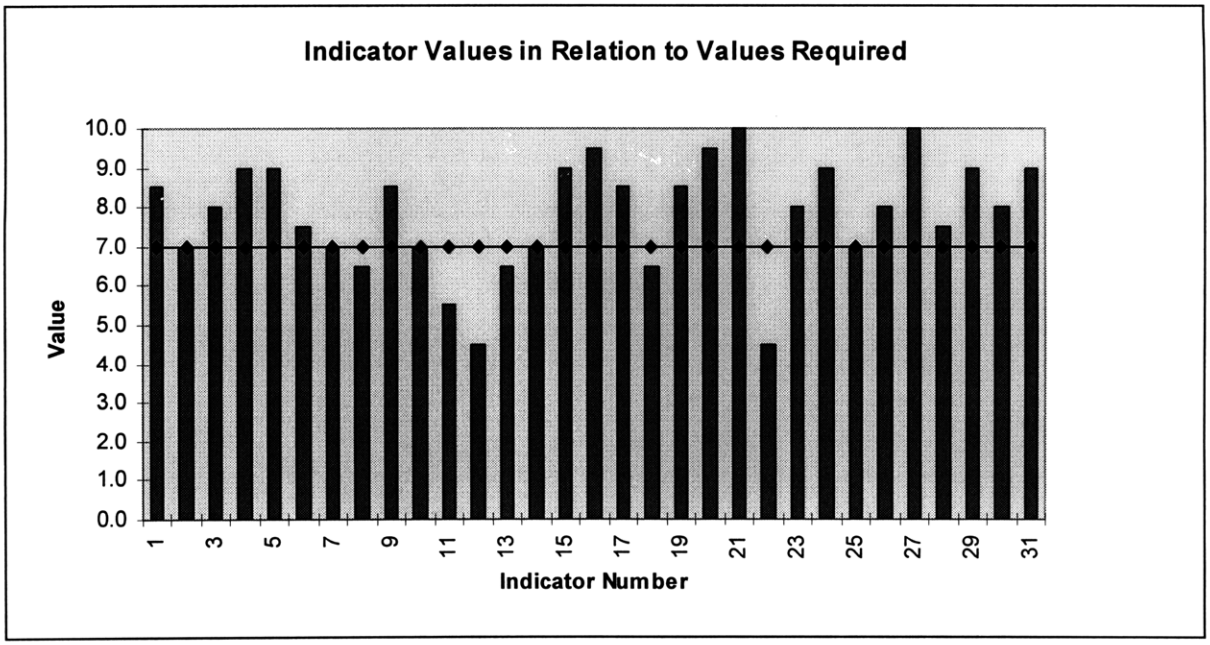

Figure 15. Sample INFRATEST Indicator Values in Relation to Values Required

Factor Name	Factor Number	Factor Score	Factor Score Required
Infrastructure Market Constitution	1	7.8	7
Service Territory Demand	2	8.5	7
Developer Infrastructure Industry Experience	3	7.3	7
Developer Industry Position	4	6.3	7
Developer Managment Characteristics	5	6.0	7
Financial Information Quality	6	9.3	7
Projected Earnings Stability	7	7.5	7
Debt Coverage Adequacy	8	9.3	7
Financial Leverage	9	4.5	7
Financial Flexibility	10	8.0	7
Financing Package	11	8.0	7
Completion Risk	12	8.8	7
Regulatory Climate	13	9.0	7
Project Environmental Merits	14	8.0	7
Project Technology Merits	15	9.0	7

Figure 16. Sample INFRATEST Factor Results

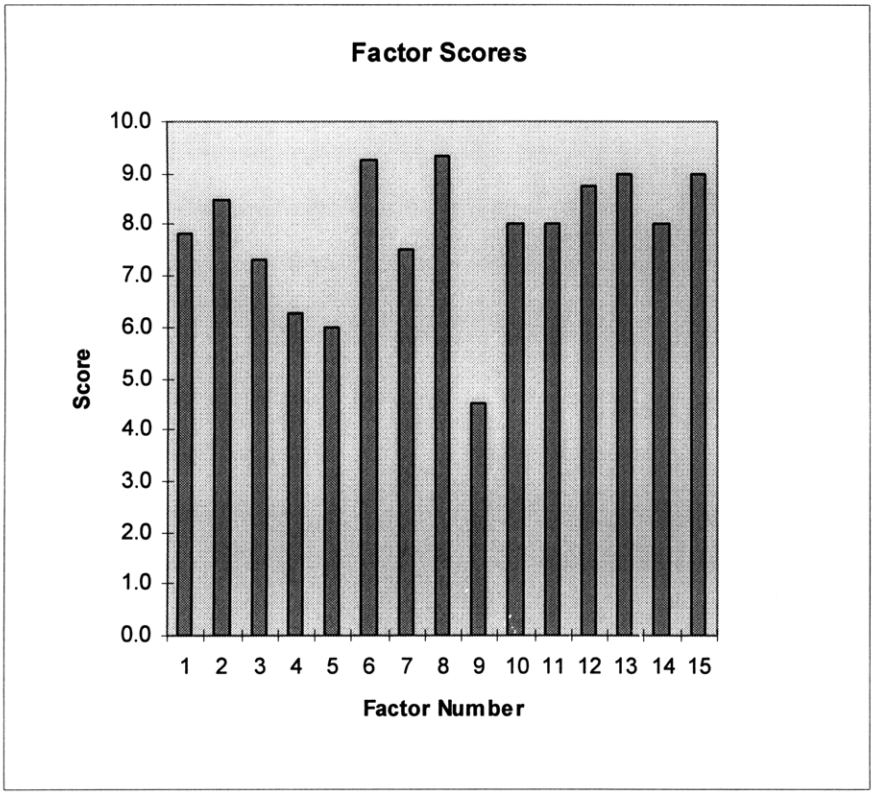

Figure 17. Sample INFRATEST Factor Scores

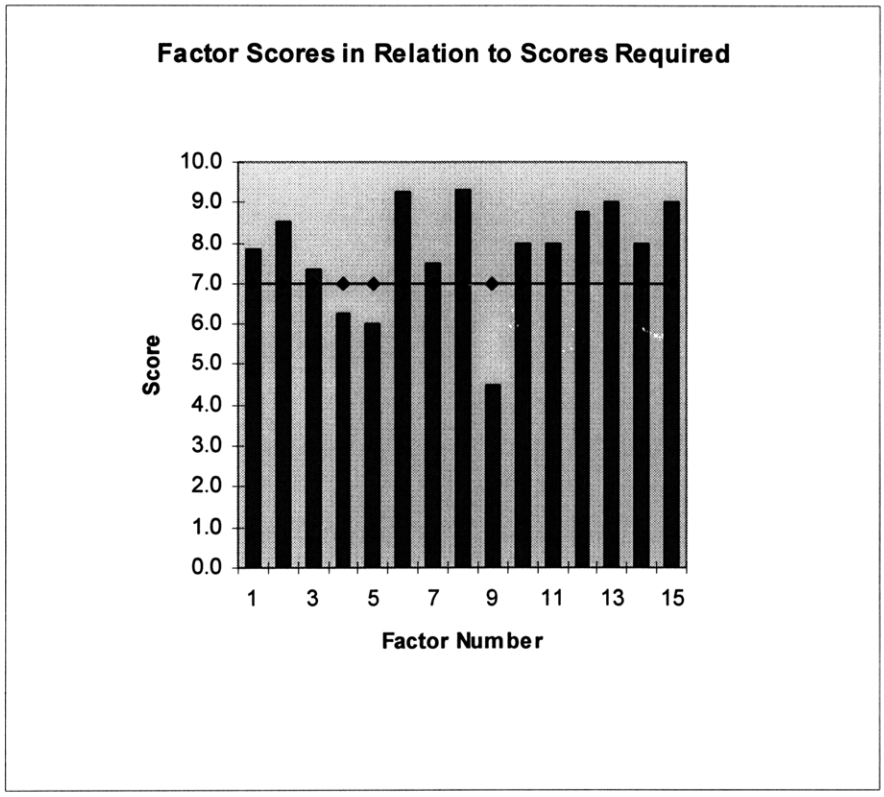

Figure 18. Sample INFRATEST Factor Scores in Relation to Scores Required

Specific Factor		Contributing							
Name	Number	Factors	Contributing Factor Scores					Factor Score	Percentile
Business	1	1 thru 5	7.8	8.5	7.3	6.3	6.0	35.9	72%
Finance	2	6 thru 10	9.3	7.5	9.3	4.5	8.0	38.6	77%
Project	3	11 thru 15	8.0	8.8	9.0	8.0	9.0	42.8	86%

Figure 19. Sample INFRATEST Specific Factor Percentiles

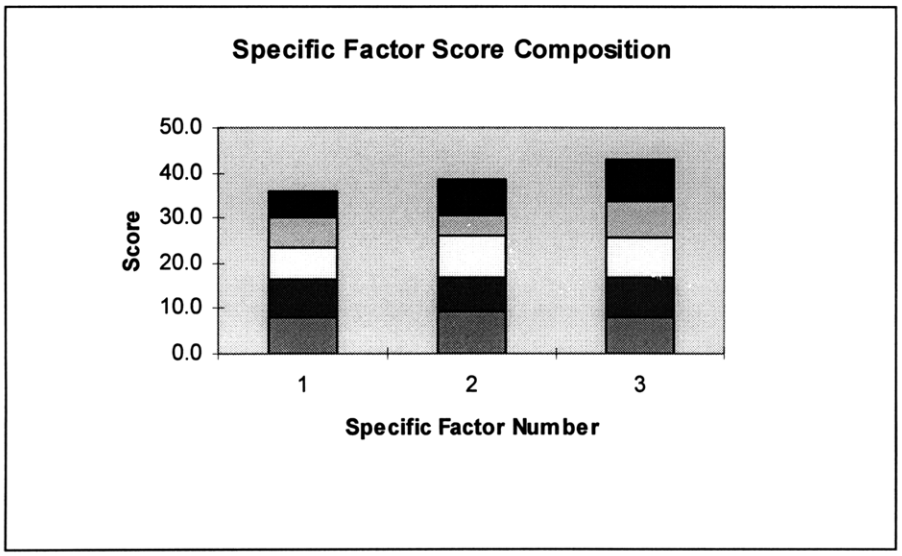

Figure 20. Sample INFRATEST Specific Factor Score Composition

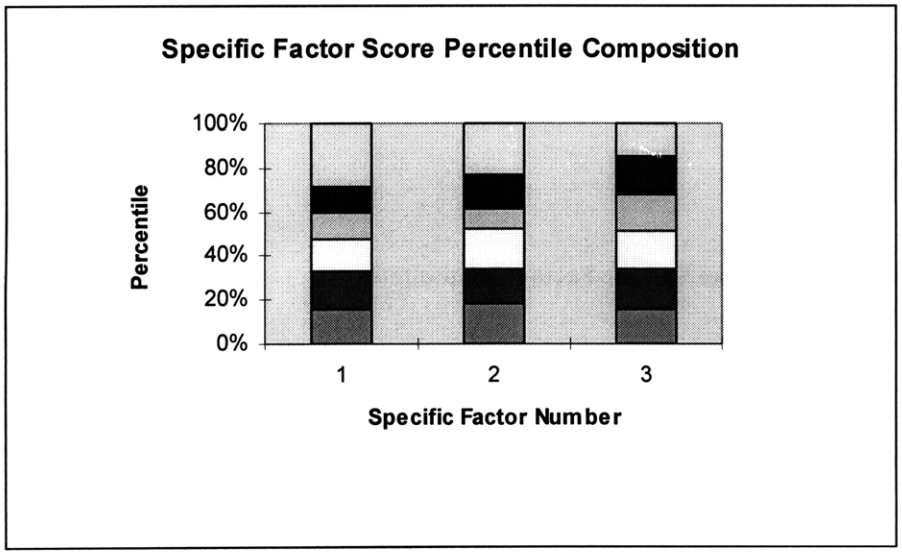

Figure 21. Sample INFRATEST Specific Factor Percentile Composition

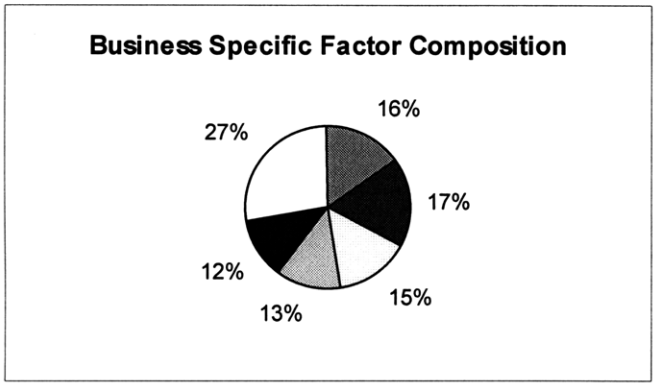

Figure 22. Sample INFRATEST Business Specific Factor Composition

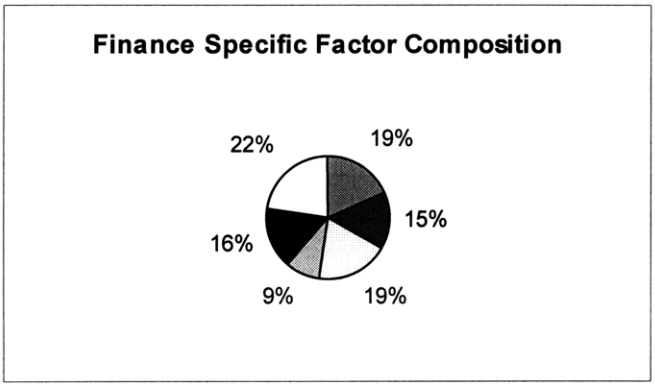

Figure 23. Sample INFRATEST Finance Specific Factor Composition

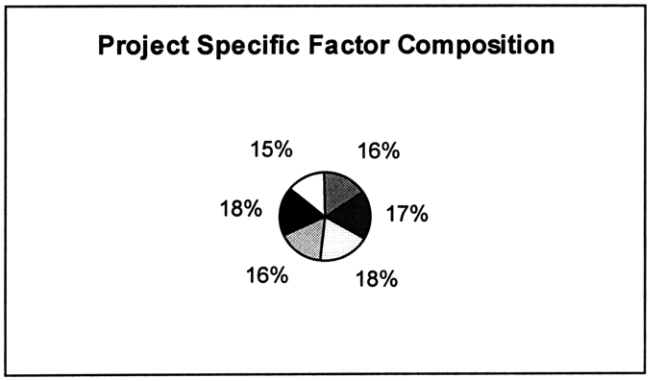

Figure 24. Sample INFRATEST Project Specific Factor Composition

Contributing Specific Factor Scores			Overall Quality Rating	Percentile
35.9	38.6	42.8	117.3	78.2%

Figure 25. Sample INFRATEST Overall Project Quality Percentile

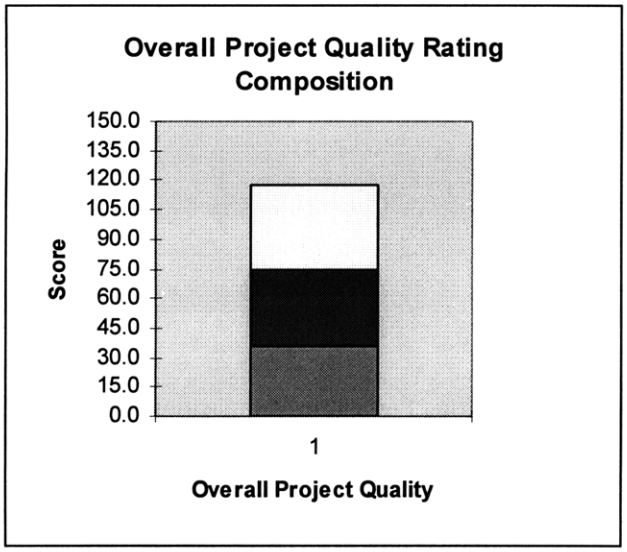

Figure 26. Sample INFRATEST Overall Project Quality Rating Composition

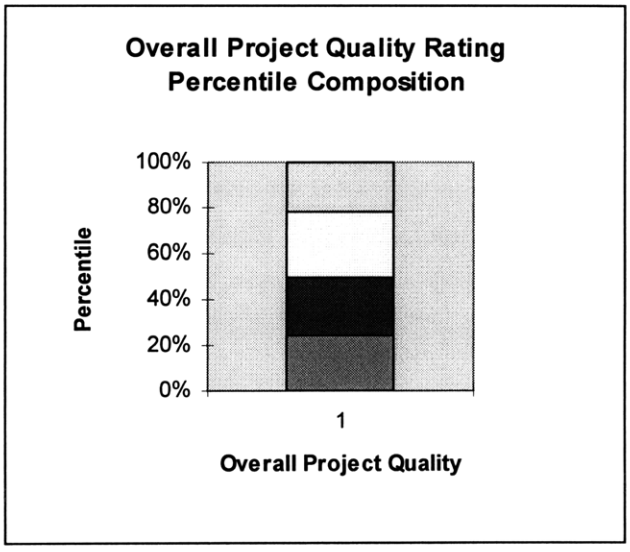

Figure 27. Sample INFRATEST Overall Project Quality Rating Percentile Composition

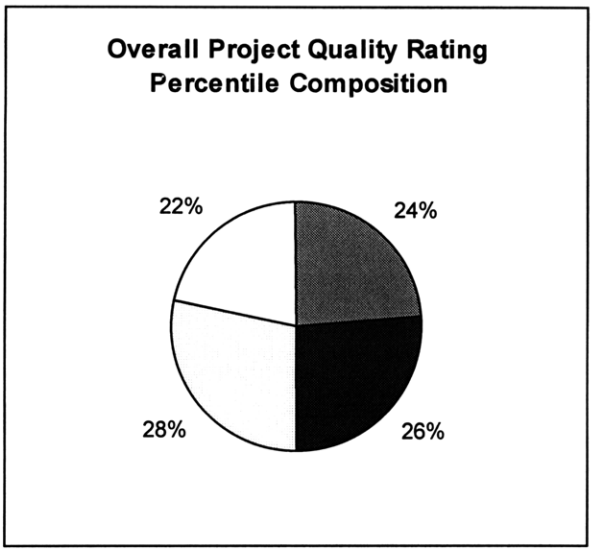

Figure 28. Sample INFRATEST Overall Project Quality Rating Percentile Composition

7. APPLICATION OF INFRATEST

7.1 BACKGROUND REMARKS

In the following sections, the Infrastructure Project Quality Assessment Method will be applied to two separate private sector infrastructure projects: the Santa Ana Viaduct Express (California State Route 57) and the Northumberland Bridge (between Prince Edward Island and New Brunswick).

To simulate actual use of INFRATEST by a project developer or a public sector planner, a small package of materials was provided about each of the projects for use in the analysis. This initial amount of project specific data was used by the rater in the application of INFRATEST. No additional information was compiled and no outside opinions were sought. All discussion is based solely on the initial provision of project information and the rater's humble experience.

Each project is taken as a potential private sector infrastructure development. The varying quantity and quality of project data is assumed to reflect real-world conditions. Application of INFRATEST results in a preliminary evaluation of the project's private sector viability. Depending on the INFRATEST result, the public entity can send this proposal to the private sector or the project developer can send this proposal to the capital market institutions. Alternatively, the public entity can decide to develop the project with public funds or the project developer can choose to reject the project for future consideration.

7.2 SANTA ANA VIADUCT EXPRESS [SAVE] (EXTENSION OF CALIFORNIA STATE ROUTE 57)

Information for the SAVE project is taken from the *Request for Qualifications for Toll Revenue Transportation Projects* (November 1989), the *Guidelines for Conceptual Project Proposals for Toll Revenue Transportation Projects* (March 1990), *the Request for*

Qualifications for Financial Consultant for Toll Revenue Transportation Projects (March 1990) provided by the California Department of Transportation and from the *Santa Ana Viaduct Express Proposal for A Toll Revenue Transportation Project* presented to the California Department of Transportation, Office of Privatization, by The Perot Group (August 1990). No other sources were used.

The proposed project, SAVE, is a four lane elevated limited access cars only express tollway which links existing State Route 57 with Interstate 5 and State Routes 22 and 55 at its northern terminus and Interstate 405 and State Route 73 at its southern terminus. The tollway runs for a total of 11.7 miles: 8.3 miles in the middle of the Santa Ana River flood control channel along the Santa Ana River corridor, 3.0 miles along Interstate 405, and 0.4 miles along State Route 73. It is located within the right-of-way of the Santa Ana River flood control channel, currently authorized for use as a U.S. Army Corps of Engineers flood protection project, and along portions of the existing Route 73 and Interstate 405 freeways. The project area crosses the city limits of Anaheim, Orange, Santa Ana, Fountain Valley, and Costa Mesa. Project length is approximately 73 for a total of 11.7 miles (See Figure 23).

The SAVE project has been proposed under the auspices of Caltrans AB 680. AB 680 provides for the "California Department of Transportation to enter into agreements with the private sector to grant exclusive development rights to construct four transportation projects and receive toll and related value-added revenues for a maximum of 35 years."

The Perot Consortium represents the developer for SAVE. The Perot Consortium is made up of The Perot Group, Greiner, The First Boston Corporation, Traffic Consultants, Incorporated, Amtech, URS / Coverdale and Colpitts, Robert G. Neely, Kiewit Pacific Company, Nossaman, Guthner, Knox, and Elliott, and Putnam, Hayes, and Bartlett, Incorporated. These firms contribute expertise in the following areas: overall project management, operation of toll facilities, design engineering, construction, project financing, transportation studies and planning, toll equipment, related legal services, and toll rate economic modeling.

Completion of an INFRATEST checklist indicates adequate project information to complete a meaningful project evaluation for preliminary assessment (See Appendix 2A, 2B, and 2C) Application of INFRATEST results in the following analysis.

Factor 1: Infrastructure Market Constitution Score: 8.2

Indicator 1: Growth Phase Value: 8.5

The infrastructure market for toll roadway and/or bridge projects holds much economic promise. This strong growth forecast is founded in the inability of the federal government to provide much needed transportation project funding and in the realization of the private sector's capability to provide economically efficient transportation project developments. For the west coast, toll projects are still few and far between: the market is in its infancy. However, as the financial necessity and viability of such projects becomes increasingly accepted and supported, the market can only expand and grow. Time is the only constraint on such growth.

The need for alternative forms of infrastructure project development promises to intensify as population grows, environmental regulation increases, and infrastructure ages, creating high demands for capital spending. America's transportation needs far exceed current spending. Highway capacity has not kept pace with the rapid increase in travel by the nation's passenger and commercial fleet. A total of $86.8 billion would be required to achieve needed improvements in national transportation systems. In addition to the lack of funding resources, there is an increased understanding on the part of governments that they should not own and/or operate certain types of facilities because of their less efficient utilization of resources, when compared with the more flexible and cost-conscious private sector. The private sector can be a more effective provider of public transportation infrastructure. It encourages the optimization of operation and construction costs. Projects of the build-own-operate type focus on achieving an optimum balance between initial capital costs and

operating costs. Public spending controls can result in an overemphasis on driving down initial investment to the detriment of costs over the lifetime of the project. In addition, placing responsibility for both design and construction within a single organization facilitates cost-effective solutions to design, construction, and operation conflicts.

Indicator 2: Economic Effects Value: 7.5

The toll transportation infrastructure industry is characterized by a strong unrealized market potential and many uncertainties in demand and acceptance of toll road facility development.

The provision of public highways by the private sector suggests a new approach to providing transportation services. Roads are seen as a consumer product. Various levels or qualities of service are given for different prices. The private sector's role in providing sufficient roadway capacity is to segment the market, offering the road user a realistic choice between existing free routes that are congested and a toll route that offers a higher quality of service and available roadway capacity. With this revolutionary and unrealized market share concept, tolls can be used as a management and operational tool to ensure a high quality of service while ensuring maximum revenues. Not only do road users' perceptions embrace a wide range of attributes including freedom to maneuver, safety, driving comfort, and reduced driving times, but these consumers differ in the particular importance they attach to these road use aspects. It is this variation in road users' perceptions and valuations that allows the private sector to offer a different product from that provided by the government. In the status quo transportation infrastructure crisis, such a product can be marketed to a large and untapped consumer base.

Return on investment in toll roads is dependent on many uncertain factors. As such, tolls projects are inherently riskier than other infrastructure privatization projects. Traffic forecasts and the resulting revenue estimates are subject to considerable uncertainty. The willingness and capability of drivers to accept and pay these tolls is also very difficult to forecast. Toll routes are not essential services. Project developers must forecast the dollar

value toll roadway users will attribute to the intangible benefits of increased freedom to maneuver, safety, and driving comfort. Further, user financial ability to pay the set toll rates must also be ascertained. The availability of competing routes, historic familiarity with tolls, and area development and traffic patterns also impact estimated demand for such toll roadways.

Indicator 3: Resource Effects Value: 8.5

Empirically speaking, domestic highway construction is not prone to labor or material constraints. Toll roads are no exception as similar design and construction expertise and similar construction materials and supplies are required. The toll road as an infrastructure industry will not be hindered by resource considerations. These streams of labor and material and equipment resources are not generally susceptible to political, environmental, and energy-related pressures. In fact, private consortiums can obtain fair market-prices for all necessary labor, equipment, and materials as they are not bound by bureaucratic governmental regulations for public interest.

Factor 2: Service Territory Demand Score: 8.8

Indicator 4: Demand Forecasts Value: 8.5

Demand for the SAVE project is evidenced by the area network future traffic forecasts as well as by the traffic benefits which will result from the project construction and operation.

The SAVE project will provide a high-speed, congestion-free link for passenger cars between Interstate 405 and State route 73,at its south end, and existing State Route 57 for service to and from the Interstate 5/State Route 22/State Route 55 junction (Orange Crush), at its north end. It will exists as an alternative for motorists now using congestion-prone State Route 55 and the surface streets through Santa Ana.

The SAVE project will be built as a four-lane highway to meet this function and to meet the requirements of a financially viable toll facility. Tolls will be established at levels high enough to maximize revenues and, at the same time, to constrain traffic volumes on the project through congestion pricing. This maintains acceptable levels of service on the facility.

With pricing congestion, traffic volumes on the SAVE project are constrained by price. As such, true demand for the SAVE project is clarified by comparing current, 2010 no build, and 2010 4-lane capacity constrained (with I-5 connection) traffic estimates. Traffic assignments are expressed in terms of average weekday traffic volume, by direction. Such traffic assignments are most readily compared on a screenline basis, with the east-west screenline intercepting the north-south arterials and the north-south screenline intercepting the east-west arterials. Figure 29 summarizes the network traffic assignments for each of the screenline arterials for the three alternatives. The fundamental comparisons shown in Figure 30 reflect the relief to the existing highway network provided by the SAVE project.

The reductions of five to seven percent suggest a decrease of vehicle-miles-of-travel of the same magnitude throughout the entire highway network, bringing the benefits of reduced congestion and improved levels of traffic service.

The 2010 no-build traffic assignments can be used to establish growth rates (See Figure 31). Average annual growth rates for the area range from -0.6% to 5.2%. The overall area traffic average annual growth rate is 1.8%.

Further illustrating its demand potential, several bottlenecks of congestion would be relieved by construction of SAVE.

Many of Orange County's status quo highways are currently carrying volumes of traffic well beyond their capacity, operating at levels of service unacceptable to area residents. The most direct existing route from the Disneyland/Anaheim Stadium area to the John Wayne Airport

available today is Interstate 5 and State Route 55. It takes almost an hour to traverse about ten miles of these roadways during peak travel times as these roadways carry from 200,000 to 235,000 vehicle trips per day (average annual daily traffic), operating at levels of service F for long periods. The diversion of traffic provided by the SAVE would lower the travel time 20 - 30 minutes each way.

Perhaps the most congested interchange in Southern California is the "Orange Crush," the Interstate 5/State Route 55/State Route 22 intercept. The SAVE would give motorists an express, controlled access alternative route to Interstate 405 by tying into State Route 57 north of this interchange.

Similarly, traffic congestion in the Interstate 405/State Route 73 corridor would also be lowered from project operation. In this vicinity, Interstate 405 currently carries upwards of 270,000 vehicles per day. The proposed project provides a direct north-south to west-east connection between State Route 57 and the project terminus at State Route 73 via elevated structures that connect the mainlanes of both facilities.

Indicator 5: Socioeconomics of Service Territory Value: 9.0

The SAVE project is supported by a sizable and wealthy service area capable of supporting the proposed toll rate schedules. The service area is bolstered by several noteworthy destinations: tourist stops such as Disneyland and Knotts Berry Farm, Anaheim Stadium and its sports related franchises such as the Angels and the Rams, John Wayne Airport, major upscale shopping centers such as South Coast Plaza, and large commercial office parks such as the Irvine Business Complex.

In 1996, Orange County's per capita personal income was $32,548, compared with California's $25,004. Approximately 45% of those households fell into the highest effective buying income of $50,000 or more, which is substantially higher than those of the state or nation. The area experienced an 1.8% average annual population growth rate between 1990-

1997. Projections for 2010 indicate 2% average annual population growth. Such income and population trends are sufficient to back the SAVE project revenue forecasts.

Overall unemployment for the Orange County area has been relatively moderate at 5.0% in 1996, compared with 7.2% for the state and 5.8% for the nation. The unemployment rate has dropped substantially during the past four years, reflecting the regional economy's substantial growth.

The area to be served is almost fully developed. However, some future re-development and transition of land use types is inevitable after the facility is constructed.

Indicator 6: Infrastructure Network Position Value: 9.0

The SAVE project would complete the central regional transportation system of Orange County.

Numerous studies over the last two decades have shown that the proposed improvement would greatly augment the efficient function of Orange County's major north-south transportation corridor. The need for the extension of State Route 57 to complement and enhance Orange County's roadway network has been articulated since the early 1960's. As evidenced by its repeated inclusion in the various planning documents during the ensuing period, the concept of the State Route 57 extension remained an integral link in the areawide roadway system. Of late, the State Route 57 extension project has become more attractive as the interconnectivity of the present roadway system has improved and matured and more and more viable transportation corridors have been lost to development,

In addition, the State Route 57 extension is a major component of the Southern California Association of Government's Regional Mobility Plan (1989). Objectives of this plan include reducing daily congestion, limiting the daily vehicle hours of travel, increasing the number of people ridesharing, and reducing mobile emissions.

The proposed cross-section for the SAVE project includes an envelope for future transit development to be contained between the separate northbound and southbound lanes of the tollway facility. It is anticipated that the Santa Ana River channel corridor used by the project would become an integral link in the developing fixed guideway transit network for the Orange County region. At its southern terminus, the project would connect with the San Joaquin Hills Transportation Corridor and with John Wayne Airport. At its northern terminus, the project would connect with transit routes serving Ontario and Los Angeles International Airports and with other transit routes connecting Orange County with Riverside and San Bernardino Counties and the LosAn corridor with further connections to Orange, Los Angeles, and San Diego Counties. The northern terminus is also very close to the new Amtrak Station at Anaheim Stadium and the future high-speed rail project proposed to operate between Anaheim and Las Vegas.

Factor 3: Developer Experience Score: 8.3

Indicator 7: Engineering Experience Value: 9.0

The Perot Consortium will rely on Greiner for the SAVE project's design engineering.

Greiner is a publicly owned corporation headquartered in Irving, Texas which employs over 1,300 people. Since 1908, Greiner has provided consulting services, predominantly in surface transportation, to private, public, and governmental clients in 45 states and territories of the United States and 32 foreign countries. The firm has worked on highway and bridge projects whose construction costs exceed $15 billion. Both bridge design and highway engineering have historically comprised a vast portion of Greiner's professional practice. Specifically, Greiner's highway design experience includes a full breadth of engineering services, including: feasibility and location studies, preliminary plans and environmental assessment through final design, and construction administration. Projects have ranged in scope and size from some of the most significant highways in the United States to local

arterials. Greiner served as the General Consultant for the original Pennsylvania, Ohio, and Indiana Turnpikes. In this capacity, it has been responsible for over 1,000 miles of toll roads and related facilities across the United States. To date, Greiner has served as consultant for more than 50 major toll road projects, the value of which exceeds $3.0 billion. In addition, Greiner led the industry in the formulation of design criteria for roadways, bridges, and interchanges which is the basis for the ultimate criteria adopted for the entire interstate system. Today, Greiner has retained a leadership role in the design of major new facilities and has remained in the forefront of technology for rehabilitating, widening, and upgrading existing highway, bridge, and interchange projects.

The hallmark of any design effort is the recognition it receives from the technical community. Over the years, Greiner has received numerous awards at the national, state, and regional levels for design excellence and innovation in solving transportation related programs.

Indicator 8: Construction Experience Value: 10.0

Kiewit Pacific Company will build the SAVE project.

Kiewit Pacific Company is a subsidiary of the Kiewit Construction Group, Inc. which was founded in 1884 and has a reputation for building rigorous, complex, and demanding projects. The firm was ranked 18th out of 400 top contractors by Engineering News Record with $1.385 billion in 1989 construction projects. Kiewit excels in the transportation arena, having built some of the most ambitious and diverse transportation projects in North America, including highways, bridges, tunnels, airport runways, and mass transit systems. Kiewit is the nation's largest highway contractor, beginning work on approximately $300 million in transportation projects in 1989. One of Kiewit's strengths is its ability to successfully complete projects that have a demanding schedule and continuous traffic exposure. Speicifically, it is the contractor for the first build-operate-transfer toll road in the United States. Working with the Toll Road Corporation of Virgina, Kiewit will break ground on the 4-lane, 15-mile segment of the Dulles Toll Road in 1991 which includes six

interchanges and 36 bridges. The project is a turnkey and all construction must be completed within a 24 month period.

Indicator 9: Management Experience Value: 6.0

While The Perot Group may bring a unique philosophy and approach to the privatization of transportation infrastructure, it lacks prior experience with the management and operation of toll road facilities.

The Perot Group is known for its commitment to quality, financial strength, and diverse professional expertise. Through the scope and extended life of its projects, The Perot Group desires to ensure its future at the leading edge of national development. As a Perot Group Affiliate, Hillwood Development is a national real estate development company with diverse projects, encompassing more than 22,000 acres, including prime office and retail development, located in 15 cities throughout the United States. As it is as concerned with a region's growth over the decades as it is with its vitality today, The Perot Group's projects are created and built with a long-term outlook to meet the needs of business now and in the future. This is reflected in many ways. In addition to real estate, the company's interests include venture capital, Perot Systems Corporation, and the Perot Foundation.

The Perot Group's management vision has successfully guided both major private and public/private efforts from inception through design, environmental approval, construction, and long term ownership and management.

As an example, The Perot Group led an unprecedented program of public/private investment in new transportation infrastructure in Fort Worth, Texas. Through close cooperation at the local, state, and federal level, The Perot Group was a key advocate and participant in expenditures for surface and air transportation improvements, including the nation's first industrial airport, improvements to the Interstate Highway System, and expansion of the State Highway and arterial street system. Activity centered about the Alliance regional

development which constitutes over 12,000 acres north of Fort Worth. This is Hillwood Development Corporation's largest project. The centerpiece of this project is Fort Worth Alliance Airport, the first airport conceived and built for the industrial user. Surrounded by a 5,000 acre master planned development, the airport, in concert with the adjoining railroad and freeway system, creates a unique international business and industrial center.

The fast track schedule includes environmental impact studies, engineering and design plans for the runway and airport support facilities, and project management. Alliance is the first new airport built in America since the completion of Dallas Fort Worth Regional Airport in 1974. With its 9600' runway and advanced technology in instrument landing systems, the new airport has already attracted a variety of users.

The Perot Group is also involved in several highway improvements within the area. Upgrading of a 12-mile segment of State Highway 114 to freeway status, developing a new 7-mile freeway (State Highway 170), and developing new interchanges along a 12-mile segment of Interstate 35 West are the major project tasks. These freeway networks will connect Dallas-Fort Worth Regional Airport, Fort Worth Alliance Airport, and downtown Fort Worth. The Perot Group provided all engineering and design fees for preparation of construction plans, right-of-way plans, and receipt of environmental clearance from the Federal Highway Administration. These public infrastructure improvements discussed here were realized through a unique private/public partnership conceived and developed by the Perot Group.

Factor 4: Developer Industry Position Score: 8.0

Indicator 10: Sales Position Trends Value: 8.0

No specific sales information for the firms comprising The Perot Consortium was available at rating time. However, as The Perot Consortium passed the selection criterion for companies established by Caltrans in its Request for Qualifications, it can be assumed that it possesses

the necessary business resources and capacities to take its proposed infrastructure development to completion: engineering, environmental approval, right-of-way provision, construction, and operation.

Indicator 11: Operating Margin Trends Value: 8.0

No specific operating margins for the firms comprising The Perot Consortium were available at rating time. However, as The Perot Consortium passed the selection criterion for companies established by Caltrans in its Request for Qualifications, it can be assumed that it possesses the necessary financial efficiency and strength to fully commit to the SAVE project.

Factor 5: Developer Management Characteristics Score: 8.2

Indicator 12: Past Performance Value: 8.0

No specific past project information from The Perot Consortium members was available at rating time. However, the individual members of The Perot Consortium were required to demonstrate an above-average record of previous successful related projects in order to pass the Request for Qualifications selection criterion.

Indicator 13: Current Control Tools Value: 8.0

No specific current management control tools information from The Perot Consortium members was available at rating time. However, the individual members of The Perot Consortium were required to demonstrate an above-average industry practice of applying state-of-the-art organizational and management practices in order to pass the Request for Qualifications selection criterion.

Indicator 14: Future Planning Value: 8.5

No specific future firm goals from The Perot Consortium members were available at rating time. However, all consortium participants have expressed steadfast commitments to project quality and their willingness to positively position themselves for further private infrastructure development. In many ways, through future planning and continual goal setting and evaluation, The Perot Consortium firms have positioned themselves at the forefront of their various areas of expertise.

Factor 6: Financial Information Quality Score: 8.5

Indicator 15: Normality of Accounting Practices Value: 8.0

The Cash Flow Analysis was completed by The First Boston Corporation. Variable assumptions such as escalation rates, coverage ratios and reserve requirements, bank fees, and prevailing interest rates are all stated. The median case for construction costs and revenue forecasts was used to determine project feasibility.

The First Boston Corporation is an international investment bank. Head-quartered in New York, there are 140 employees in California, including municipal finance bankers and traders in Los Angeles and San Francisco. For California, since 1985, First Boston has issued $7.3 billion of financing for local governments, including $3.7 billion for transportation improvements.

Recent transportation finance experiences entail directing the first municipal toll toad financing in California for the Transportation Corridor Agencies/Orange County Toll Roads, the bond financing programs for the Los Angeles County Transportation Commission's just opened Metro Blue Line, the Metropolitan Transit Development Board's Bayside Trolley Extension, and the initial offering of $175 million for the San Diego County Regional Transportation Commission. As First Boston has brought a significant number of new transportation facilities to the capital markets and routinely develops customized computer

models to assist issuers with capital planning and determination of financial feasibility, its accounting practices can be taken as exemplifying the industry standard.

Indicator 16: Depth of Demand Studies Value: 9.0

The traffic network used to determine traffic demand forecasts and average annual growth rates was modified from the LARTS Transportation Model. It is based on modeling techniques similar to those used by the state of California for financial planning purposes. The most recent population and employment data from the Southern California region is used. Input includes data from population, housing, employment, income, and travel statistics from the base year and socioeconomic inputs such as population, total employment, retail employment, single-family dwelling units, multiple-family dwelling units, and median household incomes.

The Toll Revenue Model was developed by Putnam, Hayes, and Bartlett, Incorporated to apply the market-based pricing approach to private toll roads. Employing state-of-the-art econometric techniques and applications, the Model is designed to devise toll schedules that maximize a toll road's revenues while ensuring that predicted traffic volumes on the road are such that the advantages of the route - speed, comfort, and reliability - are preserved. It uses an iterative process whereby traffic divides between the toll road and alternative routes. This approach is based on accepted economic theories involving willingness to pay for improved access, as well as conventional engineering and design concepts involving roadway capacity, flow rates, and speed.

Putnam, Hayes, and Bartlett, Incorporated is an economic and management consulting firm which helps clients formulate and implement economically and financially sound strategies. Client problems are addressed by calling on the most effective analytical methods and tools. Since its founding in 1976 in Cambridge, Massachusetts, it has established several offices throughout the United States with a staff of over 300 employees. The firm is well-known in

the field of transportation economics and management for highly innovative consulting regarding project evaluation, toll and value-added revenue financing, and rate regulation.

Factor 7: Projected Earnings Stability Score: 9.5

Indicator 17: Operating Margins Value: 10.0

Operating income as a percentage of sales starts at 86% and increases to 99% by the termination of the project lease.

Indicator 18: Return on Capital Value: 9.0

For the median escalated total project cost and the median revenue forecasted, the return on long-term equity investment is 25.1%. This rate of return is for equity invested to take-out the initial construction loans after the project construction has been completed. As the long-term financing structure is in place and the toll road is in operation, risk is considered minimal. Such a return is indeed beyond industry averages for toll road infrastructure projects. However, the return paid on this equity investment is serviced only after senior and subordinated debt, operations and maintenance costs, and reserve funds have been settled. As such, it is the riskiest of all long-term capital invested. Such a high return is indeed earned.

As mentioned previously, the revenue forecast used considers toll revenues only. Additional revenue may be possible from value capture, airspace development, sale or sub-lease of easements, and local government assistance. These additional sources of revenue would secure this high rate of return on capital.

Factor 8: Debt Coverage Adequacy Score: 8.0

Indicator 19: Debt Service Ratio Value: 9.0

Because the project is still in an early stage, the amounts of debt and equity needed to finance the project are estimated mathematically and on a cash flow needed basis rather than on firm commitments from potential lenders or equity investors. The total of long-term financing at the take-out is found by first determining the amount of senior lien toll revenue bonds that can be financed assuming a certain interest rate, coverage ratio, and 35 year level debt service. Then the model uses the coverage cushion and projected revenue growth to estimate subordinated debt capacity. Finally, the minimum equity requirement is calculated as the difference between the bank commitment and compound equity investment outstanding and the sum of the senior and junior lien debt capacity. Following California state law, the coverage ratios for tax-exempt revenue bonds, taxable revenue bonds, and subordinated, taxable capital appreciation bonds are, within a range, driven largely by market convention. The model assumes coverage ratios of 1.3x, 1.3x, and 2.0x, respectively.

Indicator 20: Debt Service Schedule Value: 7.5

As mentioned above, the model uses a level 35 year debt service ratio of 1.3x. Senior lien toll revenue bond term offerings would be designed to create a substantially level debt service obligation by staggering maturities, creating sinking fund schedules, and utilizing partial amortization schedules with the expectation of refinancing outstanding principal prior to the balloon payment dates. Junior lien toll revenue bond term offerings would utilize zero coupon securities to be repaid in the future from projected growth in revenues. The growth in revenues predicted by the traffic and revenue study can be capitalized into current dollars

There is no provision for the empirically proved financial difficulties associated with the initial operations phase. However, as operating margins are significant, even during initial operation of the project, there is less need for an accommodating debt service schedule at the onset of project operation.

Indicator 21: Debt Service Reserve Value: 7.5

The model assumes a reserve fund requirement of 10% of the amount of bonds issued. This is fairly standard. Starting from initial operation, the reserve fund is filled aggressively to capacity in a three year period. Reserve fund deposits are terminated when the fund balance reaches an amount of $71,853,000. This is about 90% of the annual senior lien debt service.

The model does not account for using of the reserve fund and how it will be replenished. However, although this reserve is barely adequate, the healthy and increasing operating margins ensure easy replenishment of the fund in the event of its use. In addition, contingency equity may be infused, if necessary, by the consortium.

Factor 9: Financial Leverage Score: 3.0

Indicator 22: Long-term Debt to Capitalization Value: 3.0

The median case assumes initial long-term equity participation of 15% of total long-term debt. As such, long-term debt to total capitalization is 85%. The model does not assume further cash infusions from other sources of debt. Thus, the long-term equity portion will increase as the long-term debt is paid down. Such high leverage is commonplace for the large initial costs associated with a major infrastructure project. In addition, the projects significant operating margins will facilitate strong reduction of debt and enhance the refinance potential.

Factor 10: Financial Flexibility Score: 8.5

Indicator 23: Composite Evaluation of Basic Financial Ratios Value: 8.5

The model does not make provision for an undesignated reserve fund. However, the large operating margins do permit some degree of financial flexibility. The sizable combined financial resources of The Perot Consortium coupled with these healthy operating margins

should facilitate access to short-term capital markets and long-term refinance, if necessary. Contingency equity infusions from consortium members could also be arranged.

Future refinancing of senior lien bonds to repay balloon principal is anticipated. Zero coupon bonds would allow capitalization of future increased traffic revenues in current dollars.

Factor 11: Financing Package Score: 8.2

Indicator 24: Financial Recourse Value: 7.5

The SAVE project is a non-recourse project. Both senior and junior lien long-term debt will be serviced from toll revenues. Additional revenue may be possible from value capture, airspace development, sale or sub-lease of easements, and local government assistance. However, the financial feasibility analysis does not account for these additional sources of revenue. However, the members of The Perot Consortium would be very motivated to ensure prompt and full debt service. Their main lines of businesses are to provide real estate development, design, engineering, construction, and other services for roads and other major public works projects. Successful project participation in Caltrans' AB 680 would positively position these firm to garner other infrastructure privatization work, strengthening their related market share or opening a new line of business. As such commitments to project quality and financial solvency would be strongly pursued. In essence, The Perot Consortium believes in the viability and importance of such a pioneering infrastructure privatization project.

Indicator 25: Creditworthiness of Developer Value: 9.0

Of utmost importance, the Perot Consortium possesses the financial strength to ensure successful project engineering, construction, operation. The strength of such a commitment is backed by adequate professional resources. Timely and full debt service is thus secured.

Compelling developer motivations to ensure prompt and total debt service entail future access and consideration to and for other infrastructure privatization project markets.

The Consortium's commitment and ability to repay debt service in the event of project financial difficulties can also be seen in its willingness to contribute $47 million in equity to the pre-construction financing if outside private equity sources cannot be found. Further, if necessary to the financial solvency of the project, The Perot Consortium also intends to provide contingency equity for construction and operations.

Indicator 26: Finance Mechanism Value: 8.0

Indicator 26 evaluates the long-term financing package. Pre-construction and construction financing are evaluated in the Factor 27: Completion Risks.

With construction completed and the project ready for revenue generation, much of the uncertainty present at the outset of is gone. As the all-in cost of bank financing and the rate of return being earned by initial equity investors is likely to be high in relation to this lowered residual investment risk, a permanent and more efficient multi-tiered capital structure is beneficial. Senior lien toll road tax-exempt and taxable revenue bonds secured by a first lien on net toll revenues would be the main source of take-out financing. Based on market conditions, the form of senior lien take-out financing would be a combination of publicly offered current coupon bonds, private placements, and direct bank or bank supported debt. The second source of take-out financing is subordinated current coupon and capital appreciation bonds secured by a pledge of net revenues not needed for reserve funds or for senior lien debt service. Using zero coupon securities to be repaid in the future from projected growth in revenues, the growth in revenues predicted by the traffic and revenue study can be capitalized into current dollars. Additional funds will be provided by long-term equity contributions. Although equity dollars are used to pay initial project costs, equity investors earn dividends only after operations and maintenance costs, reserve fund obligations, and senior and junior lien debt have been paid. As such, the return gained is

much higher than that of any lender. Potential long-term equity lenders include sophisticated institutional and high net worth investors, local governments, local businesses, and members of The Perot Consortium.

The minimum amount of equity would be determined mathematically by first calculating the sum of senior and subordinated lien debt capacity based on the projected revenue stream and then subtracting that sum from the total amount of the bank construction loans and compounded initial equity amounts.

Median case estimates a capital structure composed of $718 million (49%) Senior Lien Debt, $532 million (36%) Junior Lien Debt, and $225 million (15%) long-term equity. Using tax-exempt and taxable revenue bonds and zero coupon bonds will lower long-term interests costs. Private placements and bank loans carry only slightly higher interest costs. The higher rate of return long-term equity contributions will be minimized to further reduce interest costs.

Factor 12: Completion Risks Score: 9.0

Indicator 27: Development Phase Risks Value: 10.0

The SAVE project is characterized by broad local community and government support and ease of implementation.

The SAVE represents the culmination of a concept that has been included in most regional plans for over two decades: the extension of State Route 57 from Interstate 5 to Interstate 405. Broad community support has been garnered and many letters and resolutions in favor of the project from affected public agencies and wide-spread favorable support via editorials in local newspapers have been documented.

In addition, the SAVE is a project that can be developed with a minimum of the common delays and complications which usually plague the construction of large public works in highly urbanized areas. As the vast majority of the right-of-way is already under public ownership, protracted condemnation procedures would be kept at a minimum. This joint use of public rights-of-way for transportation allows the SAVE project to be implemented with a minimal requirement for acquiring new rights-of-way. Total additional right-of-way is anticipated to be less than 20 acres. These are isolated sections of the SAVE project where ramp connections to interchanging facilities may extend outside the existing right-of-way of the river or of the other roadways. Construction can begin in areas where the right-of-way was scheduled for early acquisition. Potential delays in the acquisition of non-public right-of-way would have only minimal affects, if any.

Similarly, because the Corps' Santa Ana River Project has already been subject to study and has won environmental approval, many of the downfalls related to that process would be avoided. Preliminary environmental assessment and engineering design illustrate that the SAVE project could be completed within the confines of the Santa Ana River Project with little impact and/or modifications to the flood control channel improvements project. Specific SAVE related topography and geology, erosion and siltation, water quality, and groundwater effects are minimal as the project is elevated above the Santa Ana River flood channel. Effects on plant life and animal life from SAVE construction and operation are minimal compared to those from the flood channel construction. The impact of the environmental and public involvement process on the critical path has been largely diffused, allowing other project activities (PS&E, right-of-way plans, limited right-of-way acquisition, and utility adjustments) to proceed throughout the project approval process.

All pre-construction financing will be provided by The Perot Consortium and private placement. The amount of pre-construction financing is expected to be $47 million.

Indicator 28: Delivery Phase Risks Value: 8.0

The SAVE project schedule has been set to facilitate opening to traffic in the shortest possible timeframe. This is achieved by creative sequencing and overlapping of individual tasks. Further, the project team will rely on Critical Path Management techniques for tracking the progress of critical tasks and key variables during the construction stage. The Perot Consortium is extremely motivated to shorten the amount of time leading up to the completion of construction. Any delay during the six years anticipated for planning, design, and construction which results in the deferment of income from toll revenues affects the financial performance of the project. Mitigation of delivery phase delay risks will be done by early detection and resolution of problems which may potentially delay the project, minimization of the affect of unanticipated delays on the critical path, and increased coordination amidst involved parties and/or utilization of calendar day contracts with appropriate penalty/reward incentives.

Construction financing will only be secured after a fixed price, guaranteed construction contract has been signed and a second traffic and revenue study have been completed. Construction financing would be secured in an amount adequate to cover estimated construction, contingencies, financing, and management costs prior to completion. For the median case, funding commitments of $1.425 billion are required. Sources are bank syndicate loans and consortium equity funds (other local interest business partners and high net worth investors). Interest on construction loans will be minimized by accelerating the construction process, funding early construction draws with a combination of equity and debt, and borrowing funds only when they are need to make construction payments.

At this time, the contract has not been written up. It is assumed that it will have the necessary insurance, penalty/incentive, and dispute resolution procedures and clauses.

Factor 13: Regulatory Climate Score: 10.0

Indicator 29: Developer Power to Set Rates Value: 10.0

The Perot Consortium will have complete authority to set the toll rates according to their congestion pricing market share strategy. Under AB 680, Caltrans will grant the developer "exclusive development rights" to construct the toll project and receive toll and related value-added revenues.

Factor 14: Project Environmental Merits Score: 9.0

Indicator 30: Commitment to Environmental Considerations Value: 9.0

The SAVE project is viewed as a needed improvement by both Orange County and the agencies responsible for air quality planning as it would lower congestion on other over-capacity highways and local streets without encouraging significant new growth in undeveloped areas. Such reduced congestion would lower air pollution, smog, and consumption of fossil fuels, improving the general welfare of the residents of the region who would save commuting time.

The SAVE would further enhance regional air quality goals by minimizing fuel-burning "start and stop" traffic on existing routes. The use of congestion pricing and demand management assures a high level of service and free-flow traffic during peak periods, thus eliminating congestion on the SAVE. In addition, the proposed toll rates during peak periods would also help promote ridesharing to spread the cost of travel among occupants. The design and location of the project in the middle of the river channel and the construction of noise abatement walls will protect residents from excessive freeway noise. The SAVE project would not eliminate any major fish, wildlife, or animal communities because it will be constructed in an already-developed area along the Santa Ana River channel which has been, and would continue to be, extensively modified for flood control purposes.

The SAVE project will embrace all aspects of California's Environmental Quality Act. Equally important, it must meet the spirit of the California Environmental Quality Act which places great weight on providing a suitable living environment for the residents of California.

By reducing commuting time for residents, the project would both support environmental goals and better quality of life within the surrounding region.

Factor 15: Project Technology Merits Score: 9.0

Indicator 31: Commitment to Technology Advances Value: 9.0

Congestion pricing and traffic management can only be implemented by using state-of-the-art toll roadway technology. Amtech's electronic toll collection (ETC) and automatic vehicle identification (AVI) system possesses the sole distinction of worldwide acclaim as a transportation field technology standard. The SAVE project would use the Amtech TollTag system which is comprised of vehicle tags, scanners, and a computer system for management and billing. Scanners will be installed at entrance and exit points on the tollway. Computers linked to those scanners will calculate travel time and the appropriate toll for a given AVI equipped vehicle. Travel time data will be collected on a real-time basis and used as a primary input into the determination of the variable tolls charged. Travel time and toll price information could then be passed on to the motoring public via changeable roadside information signs and the traffic information broadcast system. This information loop could be used by SAVE project managers to reduce recurrent peak hour congestion by adjusting toll prices to the degree required to maintain traffic volumes at the optimum level.

Using a series of roadside vehicle detectors linked to the same computers used for the AVI TollTags, roadside vehicle detectors will be used to assist in the management of both recurrent and non-recurrent (incident-related) congestion. Constantly scanning the SAVE tollway lanes several times each second, the vehicle detectors could determine the presence or absence of vehicles. Data gathered by the series of detectors will be sent to the computer for use in calculation of travel times or for use in detection of stalled or damaged vehicles.

Consumer benefits of the Amtech ETC system for the SAVE are as detailed: enhanced patron convenience with TollTags as no cash is required, automatic credit card billing for

credit card patrons, no reduction of speed or lost time, no fumbling for change, and no need to stop to pay or roll down the window in inclement weather for a quicker commuting time, and augmented driver focus on traffic flow. Elimination of counterfeit, theft, and security issues associated with account cards and cash handling and enhanced audit capabilities and pricing options is also accomplished. Transaction data is collected electronically so less human error possibilities exists. Toll fee pricing can be more flexible and variable during different times of the day to accommodate emerging "congesting pricing" concepts.

7.3 NORTHUMBERLAND BRIDGE

Information for the Northumberland Bridge project is taken from *the Financial Analysis of the Northumberland Strait Crossing Project* prepared by Woods Gordon Management Consultants (May 1987), the *Economic Feasibility Assessment for the Northumberland Strait Crossing* prepared by Fianer-Good Associates Limited (July 1987), *The Socio-Economic Impact of a Fixed Crossing to Prince Edward Island: Earlier Studies Revistied, New Areas Explored* prepared by the Atlantic Provinces Economic Council (July 1991), and the *Province of Prince Edward Island 21st Annual Statistical Review* prepared by the Department of the Provincial Treasury (March 1995).

The government of Canada has a constitutional obligation to maintain a surface transportation link between Prince Edward Island and the Canadian mainland. In the past, this has been met with provision of a subsidized ferry service run by Marine Atlantic, a federal Crown Corporation, between Cape Tormentine, New Brunswick and Borden, Prince Edward Island. The Northumberland Bridge is a project proposal that will provide a fixed crossing between Canada and Prince Edward Island. Spanning 13 kilometers over water, the crossing will run from a point on the mainland just west of the ferry terminal at Cape Tormentine to a point on the Island adjacent to the ferry terminal at Borden, replacing the existing ferry service. Concerns entail crossing on the ice regime during winter.

The fixed crossing is to be financed, designed, built, and operated by a consortium of private companies. The consortium will own and operate the crossing for 35 years, during which it will collect income from two main sources: tolls to use the crossing and an operating subsidy not exceeding that currently paid to the Cape Tormentine Borden ferry service.

Completion of an INFRATAEST checklist illuminates information deficiencies for several factors (See Appendix 3A, 3B, and 3C). However, analysis is as follows.

Factor 1: Infrastructure Market Constitution Score: 6.2

Indicator 1: Growth Phase Value: 7.0

The infrastructure market for toll roadway and/or bridge projects holds much economic promise. This strong growth forecast is founded in the inability of the Canadian federal government to provide much needed transportation project funding and in the realization of the private sector's capability to provide economically efficient transportation project developments. Transferring of the financial risk of infrastructure projects from the public to the private sector will be an increasingly turned to solution. For the western hemisphere, toll projects are still few and far between: the market is in its infancy. However, as the financial necessity and viability of such projects becomes increasingly accepted and supported, the market can only expand and grow. Time is the only constraint on such growth. Such a trend of privatization is supported by the private consortium who designed and built and now operates and manages the English Channel. In fact, English legislation has led the way for infrastructure privatization.

Indicator 2: Economic Effects Value: 7.5

The toll transportation infrastructure industry in Canada is characterized by a strong unrealized market potential and many uncertain in demand and acceptance of toll road facility development.

Return on investment in toll roads is dependent on many uncertain factors. As such, tolls projects are inherently riskier than other infrastructure privatization projects. Traffic forecasts and the resulting revenue estimates are subject to considerable uncertainty. The willingness and capability of drivers to accept and pay these tolls is also very difficult to forecast. Toll routes are not essential services. Project developers must forecast the dollar value toll roadway users will attribute to the intangible benefits of increased convenience and less frequent crossing delays. Further, user financial ability to pay the set toll rates must also be ascertained. The availability of competing routes, historic familiarity with tolls, and area development and traffic patterns also impact estimated demand for such toll roadways.

Indicator 3: Resource Effects Value: 4.0

Any large scale infrastructure development will have a significant impact on Atlantic Canada's relatively small economy. Dominated by agriculture and tourism, the importation of expert engineers, contractors, and operators and the importation of large amounts of constructions materials may be constrained by the local economy.

Factor 2: Service Territory Demand Score: 7.0

Indicator 4: Demand Forecasts Value: 7.5

Demand for the Northumberland project is evidenced by nearly two decades of ferry traffic information.

Using such information as a basis, a 2.5% annual increase in private car traffic and a 2.0% annual increase in commercial truck traffic will be induced by the Northumberland Bridge construction. However, these growth increases are coming at the end of a historic decreasing annual growth trend.

Indicator 5: Socioeconomics of Service Territory Value: 6.0

The Northumberland Bridge is supported by a healthy service area. Prince Edward Island's Gross Domestic Product was C$2,349 million in 1993. This represents an increase of 4.5% over the previous year and the culmination of a trend of steadily increasing Gross Domestic Product figures. Major industries include agriculture, fishing, and forestry.

The population of Prince Edward Island also reached a new high of 134,500 in 1994. While the unemployment rate has been continuously climbing since 1987, for 1994 it is down one percent to 17.1%. In 1993, personal income rose 4.2% and wages and salaries rose 1.6%.

Indicator 6: Infrastructure Network Position Value: 7.5

The Northumberland Bridge represents an essential part of Atlantic Canada's infrastructure system. It will be the only fixed link between the Canadian mainland and Prince Edward Island. However, its large traffic capacity may overshadow the capacity of its connecting infrastructure.

Factor 3: Developer Experience Score: 2.0

Indicator 7: Engineering Experience Value: 3.0

Strait Crossing Development, Incorporated (SCDI) will rely on Northern Consultant and GTMI Incorporated for engineering design.

Northern Consultants is a wholly owned subsidiary of Morrison-Knudsen of Boise, Idaho. No specific information on Northern Consultant's or Morrison-Knudsen's related expertise or project history was initially given.

GTMI Incorporated is a wholly owned subsidiary of GTM Entrepose. Headquartered in Nanterre, France GTM Entrepose has built a distinguished international reputation for design, construction, project finance, and operations of large infrastructure projects. No specific information on GTMI Incorporated's or GTM Entrepose's project experiences was given.

Indicator 8: Construction Experience Value: 2.0

SCDI will rely on Northern Consultants, GTMI, and Ballast Nedum to build the Northumberland Bridge. No related construction experiences were detailed.

Indicator 9: Management Experience Value: 1.0

SCDI is a 100% Canadian owned corporation established in 1988 to participate in the bid for the Northumberland Bridge project. No specific infrastructure management experience was given for either of the participating firms.

Factor 4: Developer Industry Position Score: 8.0

Indicator 10: Sales Position Trends Value: 8.0

No specific sales information for the firms comprising SCDI was available at rating time. However, as SCDI passed the selection criterion for companies established by the Canadian government in its Stage I selection process, it can be assumed that it possesses the necessary business resources and capacities to take its proposed infrastructure development to completion: engineering, environmental approval, construction, and operation.

Indicator 11: Operating Margin Trends Value: 8.0

No specific operating margins for the firms comprising SCDI was available at rating time. However, as SCDI passed the selection criterion for companies established by the Canadian

government in its Stage I selection process, it can be assumed that it possesses the necessary financial efficiency and strength to fully commit to the Northumberland Bridge project.

Factor 5: Developer Management Characteristics Score: 1.0

Indicator 12: Past Performance Value: 1.0

Insufficient information.

Indicator 13: Current Control Tools Value: 1.0

Insufficient information.

Indicator 14: Future Planning Value: 1.0

Insufficient information.

Factor 6: Financial Information Quality Score: 5.0

Indicator 15: Normality of Accounting Practices Value: 1.0

Insufficient information.

Indicator 16: Depth of Demand Studies Value: 9.0

Almost two decades of ferry traffic statistics are available to project Northumberland Bridge traffic. As the tolls charged on the new bridge will not exceed those charged currently to use the ferry, these existing ferry traffic statistic are a valuable and extremely accurate base for traffic and revenue forecasts.

Factor 7: Projected Earnings Stability Score: 3.5

Indicator 17: Operating Margins Value: 3.0

As no operating costs are given for the Northumberland Bridge, operating margins cannot be calculated. However, revenue for the project will come from two sources: actual tolls and a Canadian government subsidy not to exceed C$42 million (current costs of maintaining ferry system). Toll revenue projections are secure as they are based on ferry traffic projections paying status quo ferry tolls. The Canadian government subsidy is also very secure.

Indicator 18: Return on Capital Value: 4.0

No information regarding maintenance costs is given. Return on capital cannot be calculated. However, both toll revenue and the Canadian government subsidy are very secure sources of revenue.

Factor 8: Debt Coverage Adequacy Score: 1.0

Indicator 19: Debt Service Ratio Value: 1.0

Insufficient information.

Indicator 20: Debt Service Schedule Value: 1.0

Insufficient information.

Indicator 21: Debt Service Reserve Value: 1.0

Insufficient information.

Factor 9: Financial Leverage Score: 4.0

Indicator 22: Long-term Debt to Capitalization Value: 4.0

The total cost of the project is C$840 million and will be financed through a combination of debt and equity. No proportions are given. However, the sizable C$42 million government subsidy could mitigate some risk associated with a large long-term debt to capitalization percentage.

Factor 10: Financial Flexibility Score: 4.0

Indicator 23: Composite Evaluation of Basic Financial Ratios Value: 4.0

The C$42 million government subsidy provides a measure of financial flexibility.

Factor 11: Financing Package Score: 4.5

Indicator 24: Financial Recourse Value: 7.5

The Northumberland Bridge project is a non-recourse project. However, the members of SCDI would be very motivated to ensure prompt and full debt service. Their main lines of businesses are to provide design, engineering, construction, and other services for roads and other major public works projects. Successful project participation would positively position these firm to garner other infrastructure privatization work, strengthening their related market share or opening a new line of business. As such commitments to project quality and financial solvency would be strongly pursued. In essence, SCDI believes in the viability and importance of such a pioneering infrastructure privatization project.

Indicator 25: Creditworthiness of Developer Value: 2.0

Morrison-Knudsen, GTMI, and Ballast Nedum are global companies with strong financial resources. However, no commitments for future equity infusions have been given. Further, as specific company experiences are not provided, the technical ability of SCDI is also not proven.

Indicator 26: Finance Mechanism Value: 4.0

No specific information was given pertaining to the capital structure. However, the C$42 million government subsidy should lower overall project financial risks, leading to lower interest charges by lenders.

Factor 12: Completion Risks Score: 2.5

Indicator 27: Development Phase Risks Value: 1.0

Insufficient information.

Indicator 28: Delivery Phase Risks Value: 4.0

On of the main completion risks is the adverse weather which pervades the sea and shoreline during the winter months, making erection work possible for only 34 weeks in the year. As such, measures were taken to complete most of the construction work on land. Construction of the bridge components takes place on land, followed by transport and assembly in place on the sea using two hydraulic sleds and a self-propelled floating crane.

Factor 13: Regulatory Climate Score: 9.0

Indicator 29: Developer Power to Set Rates Value: 9.0

SCDI can set first year Northumberland Bridge toll rates at a maximum of current ferry tolls. Tolls can be adjusted yearly with increases not to exceed 75% of the Canadian CPI.

Factor 14: Project Environmental Merits Score: 1.0

Indicator 30: Commitment to Environmental Considerations Value: 1.0

Insufficient information.

Factor 15: Project Technology Merits Score: 5.0

Indicator 31: Commitment to Technology Advances Value: 5.0

The Northumberland Bridge project entails minimal application of new bridge design or construction technology. Technological features include the conical ice shields at the piers, the on-site fabrication of precast spans, and the transport and placement of the bridge spans with hydraulic sleds and floating cranes.

Average Weekday Traffic (000)

Road	1987 Historical	2010 No-Build	2010 4 Lane, I-5 Connection
	East-West Screenline between 1st and Edinger		
Brookhurst	52.1	58.1	48.8
Euclid	37.9	37.9	33.4
Harbor	31.5	50.2	42.6
Fairview	39.6	50.8	53.0
Bristol	36.0	49.6	42.5
Main	27.2	27.3	25.9
Grand	42.4	49.3	43.2
SR 55	206.2	331.0	332.4
SR 57 / SAVE	---	---	88.1
Total	472.9	654.2	709.9
	North-South Screenline between Bristol and Main		
I-5	212.5	355.9	329.3
17th	25.1	37.7	28.1
1st 19.3	30.2	26.0	0.0
Edinger	31.5	34.2	30.8
Warner	24.7	28.8	26.0
Segerstrom	16.8	18.5	18.6
MacArthur	10.1	20.4	14.6
I-405	192.5	183.1	193.1
SR 55	135.2	234.1	214.8
SR 57 / SAVE	---	---	101.9
Total	678.6	938.7	957.2

Figure 29. SAVE Project Traffic Screenline Comparisons

Scenario	East-West Screenline		North-South Screenline	
	AWT	% Reduction	AWT	% Reduction
2010 No-Build	654.2	---	942.9	---
4-Lane, I-5 Connection	623.2	4.7	880.8	6.6

Figure 30. SAVE Project Potential Reduction in Average Weekday Traffic (000)

Freeway	A node	B node	Average Annual Growth Rate [%]
I-5	L.A.	Katella	2.4
	Chapman	SR 57	2.9
	SR 22	Main	2.3
	17th	Grand	2.4
	1st	SR 55	2.7
SR 57	Katella	Chapman	1.3
	Chapman	I-5	1.4
SR 22	Harbor	Fairview	0.8
	Grand	SR 55	1.8
SR 55	Katella	Chapman	1.4
	Chapman	SR 22	1.4
	SR 22	17th	1.6
	Irvine	I-5	1.5
	I-5	Edinger	2.1
	Edinger	Dyer	2.3
	MacArthur	I-405	1.6
	I-405	Baker	2.4
	Baker	SR 73	2.7
SR 73	I-405	Bread	4.3
	Bread	SR 55	5.2
I-405	Euclid	Harbor	1.1
	Harbor	Fairview	1.1
	Fairview	SR 73	1.4
	SR 73	Bristol	-0.6
	Bristol	SR 55	-0.2
	Overall Average		1.8

Figure 31. Traffic Growth Projections

8. CONCLUSIONS

8.1 Discussion of SAVE Results

From looking at Figure 32 thru Figure 37, 29 out of the 31 indicators possess values equal to or greater than 7.5. Lower indicator values are 6.0 for Developer Operations Experience and 3.0 for Long-term Debt to Capitalization. 14 out of the 15 factors have values equal to or greater than 8.0. The only lower factor value if 3.0 for Financial Leverage.

From a private developer's perspective the SAVE project demonstrates sufficient economic, financial, and technical feasibility to be presented to capital market institutions. The 6.0 indicator value for Developer Operations Experience is compensated for by The Perot Consortium's strong engineering and construction experience as well as by The Perot Consortiums Caltrans pre-qualification. The Perot Group also compensates for its lack of specific operations experience by its outstanding reputation for commitments to project quality and its healthy and sizable financial strength. The 3.0 indicator value for Long-term Debt to Capitalization is mitigated by SAVE's significant operating margins, healthy return on long-term equity, and strong debt service coverage. Additionally, unlimited contingency and emergency equity commitments have been pledged by The Perot Consortium. In the event of a cash shortfall or other financial crisis, these future equity infusions will lower the long-term debt to capitalization percentage, raising the indicator value.

From looking at Figure 38 thru Figure 47, the SAVE project's overall project quality percentile is almost 83%. Specific factor percentiles range from 75% for the finance specific to 90% for the project speficif with the business specific percentile at 83%.

From a public entity's perspective, the SAVE project is suited for private sector design, delivery, and management. It would be well advised to package this proposal for private sector development.

8.2 Discussion of Northumberland Bridge Results

From looking at Figure 48 thru Figure 63, several of the Northumberland Bridge's indicators and factors and thus its specific factor and overall quality percentiles are below private investment or private sector involvement requirements. The main cause of these indicator value and factor score deficiencies is insufficient information. From a private developer's perspective, this proposal is not ready for private market consideration and from a public entity's perspective, this proposal will not be well-suited for private development.

However, many of the information deficiencies can be overlooked if one considers the significant C$42 million Canadian government subsidy. Such a significant federal government subsidy mitigates many of the concerns usually associated with the privatization of large infrastructure projects. For the Northumberland Bridge, the primary concerns for private sector involvement have been reduced to: the ability of the forecasted toll revenues to cover the operating and maintenance and financing and repayment expenditures not covered by the government subsidy and the ability of the consortium to design, build, and operate the project.

Nevertheless, even for this analysis, project data regarding operations and financing costs, financing structure, and consortium past experiences is still lacking.

8.3 INFRATEST Conclusions

The strength of INFRATEST is its simplicity of organization and universality of application. INFRATEST addresses three major circles of proposed infrastructure project quality: business, finance, and project specific. Five factors which make up each of the specific factors for a total of 15 factors are evaluated through 31 different indicators which can be routinely applied in a straightforward manner to a myriad of proposed infrastructure projects with a multitude of design, finance, construction, and operation alternatives.

Whether it be funding shortfalls or the realization of private sector implementation efficiencies and benefits, governments worldwide are turning ever more frequently to the private sector to design, finance, construct, and operate private infrastructure projects. With the resulting proliferation of private sector infrastructure project proposals, the need for an efficient and straightforward method for engineers, developers, and/or public officials to determine a preliminary assessment of private sector project viability, independent of financial investment experts, will be increasingly evident. INFRATEST has been conceived to meet such a need. It represents a useful and resource efficient tool for the private developer or the public entity to assess the economic, financial, and technical viability of a proposed infrastructure project to determine its private market or private sector potential. INFRATEST is a project packaging aid that helps private developers decide whether particular infrastructure proposals merit presentation to the capital markets and, if not, what changes are required in the project to make it acceptable for such presentation. Further, it is also formulated as a routinized method which public officials can use to facilitate their prioritization of infrastructure demands best suited for private sector consideration and realization. Again, the focus is on project packaging - what basic elements constitute an acceptable INFRATEST rating and how a project can be changed to augment the INFRATEST rating.

Specifically, INFRATEST offers engineers and developers a basic and resource-efficient procedure for evaluating an infrastructure project proposal's business, financial, and technical strengths and weaknesses. This evaluation is designed to be completed before sending the project proposal for private market presentation and finance-expert consultation. In this way, it exists as a simple preliminary infrastructure project assessment tool which encourages only the most suitable projects to be sent to private market investor analysts. INFRATEST fulfills the status quo need for a definite and established set of procedures and criterion for preliminary infrastructure project quality evaluation. Such a tool will present engineers and developers with the opportunity to not only send the best projects forward to private markets, but the opportunity to efficiently allocate labor and capital resources to only those projects

with strong private sector attributes. The latter can be achieved by early elimination of inappropriate or poorly conceived projects through INFRATEST utilization. In practice, a private developer consortium facing a large portfolio of various infrastructure project proposals can evaluate each project against INFRATEST's 15 factors and 31 indicators to determine an initial assessment of private sector feasibility based on business, financial, and technical considerations. Projects which receive factor and indicator scores and values above a pre-determined minimum requirement deserve commitment of resources and capital for further development and presentation to capital markets.

For public officials, INFRATEST offers a simple and time and labor saving method for prioritizing specific public works demands according to private sector development feasibility as based upon project business, financial, and technical aspects. INFRATEST is formulated to be applied prior to the public entity's initiating and seeking private sector participation in the development of proposed infrastructure projects. At this stage, it can be used as a basic infrastructure project quality measuring tool which assesses the private sector advantages and benefits and developer appeal associated with a particular pubic works project. Choices can then be made as to whether the public or private sector should address specific infrastructure needs. INFRATEST enables the public sector to prioritize public works needs as to their private sector implementation feasibility and then to choose only those project most suited for private sector involvement for solicitation of private sector resources. Conversely, choices can then also be made as to how scarce public resources can be targeted appropriately to those projects with minimal private sector potential. As more and more governments are turning to the private sector to meet increasing societal demands for renewed infrastructure, INFRATEST's provision of preliminary infrastructure project quality standards will be needed. Public officials will find it helpful to quickly rank the private sector potential of various competing infrastructure developments. For those projects with a high private sector viability, INFRATEST indicators, factors, and specific factors can be used to pinpoint infrastructure project proposal strengths and weaknesses and to clarify the impact of changes in a project proposal on private sector feasibility. In practice, a public

sector planner can then use this knowledge to identify how a project is to be structured to garner intense competition when offered for award in the private sector.

Application of INFRATEST to the SAVE project and the Northumberland Bridge project, two very differently conceived, designed, delivered, financed, and operated developments, shows the method's ability to produce a clear-cut evaluation of both projects' private market and private sector possibilities in a timely manner.

Indictor Name	Indicator Number	Indicator Value	Indicator Value Required
Growth Phase	1	8.5	7.0
Economic Effects	2	7.5	7.0
Resource Effects	3	8.5	7.0
Demand Forecasts	4	8.5	7.0
Socioeconomics of Service Area	5	9.0	7.0
Infrastructure Network Position	6	9.0	7.0
Engineering Experience	7	9.0	7.0
Construction Experience	8	10.0	7.0
Operations Experience	9	6.0	7.0
Sales Position Trends	10	8.0	7.0
Operating Margin Trends	11	8.0	7.0
Past Performance	12	8.0	7.0
Current Control Tools	13	8.0	7.0
Future Planning	14	8.5	7.0
Normality of Accounting Practices	15	8.0	7.0
Depth of Demand Studies	16	9.0	7.0
Operating Margins	17	10.0	7.0
Return on Capital	18	9.0	7.0
Debt Service Ratio	19	9.0	7.0
Debt Service Schedule	20	7.5	7.0
Debt Service Reserve	21	7.5	7.0
Long-term Debt to Capitalization	22	3.0	7.0
Composite Evaluation of Financial Ratios	23	8.5	7.0
Financial Recourse	24	7.5	7.0
Creditworthiness of Developer	25	9.0	7.0
Finance Mechanism	26	8.0	7.0
Development Phase Risks	27	10.0	7.0
Delivery Phase Risks	28	8.0	7.0
Developer Power to Set Rates	29	10.0	7.0
Commitment to Environmental Considerations	30	9.0	7.0
Commitment to Technology Advances	31	9.0	7.0

Figure 32. SAVE INFRATEST Indicator Results

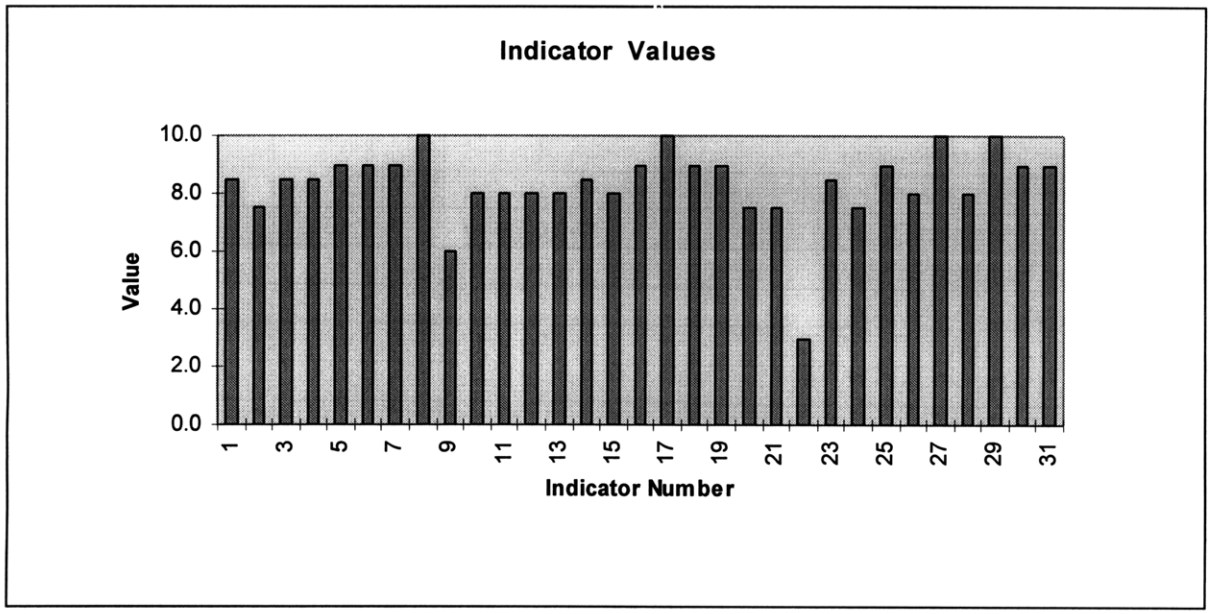

Figure 33. SAVE INFRATEST Indicator Values

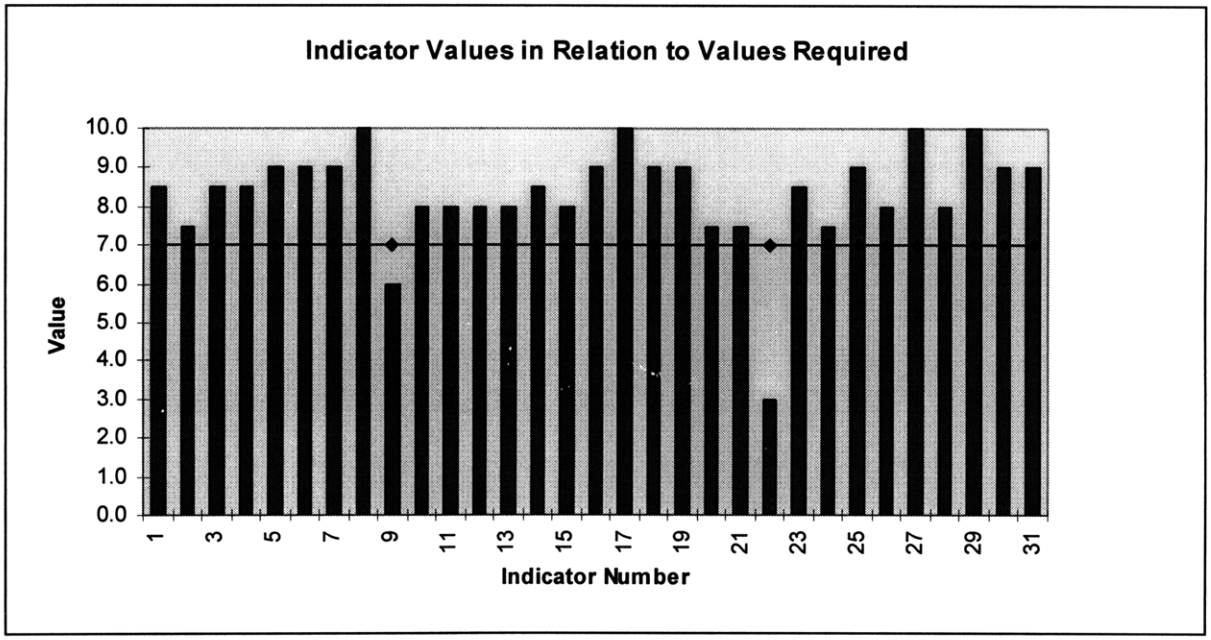

Figure 34. SAVE INFRATEST Indicator Values in Relation to Values Required

Factor Name	Factor Number	Factor Score	Factor Score Required
Infrastructure Market Constitution	1	8.2	7
Service Territory Demand	2	8.8	7
Developer Infrastructure Industry Experience	3	8.3	7
Developer Industry Position	4	8.0	7
Developer Managment Characteristics	5	8.2	7
Financial Information Quality	6	8.5	7
Projected Earnings Stability	7	9.5	7
Debt Coverage Adequacy	8	8.0	7
Financial Leverage	9	3.0	7
Financial Flexibility	10	8.5	7
Financing Package	11	8.2	7
Completion Risk	12	9.0	7
Regulatory Climate	13	10.0	7
Project Environmental Merits	14	9.0	7
Project Technology Merits	15	9.0	7

Figure 35. SAVE INFRATEST Factor Results

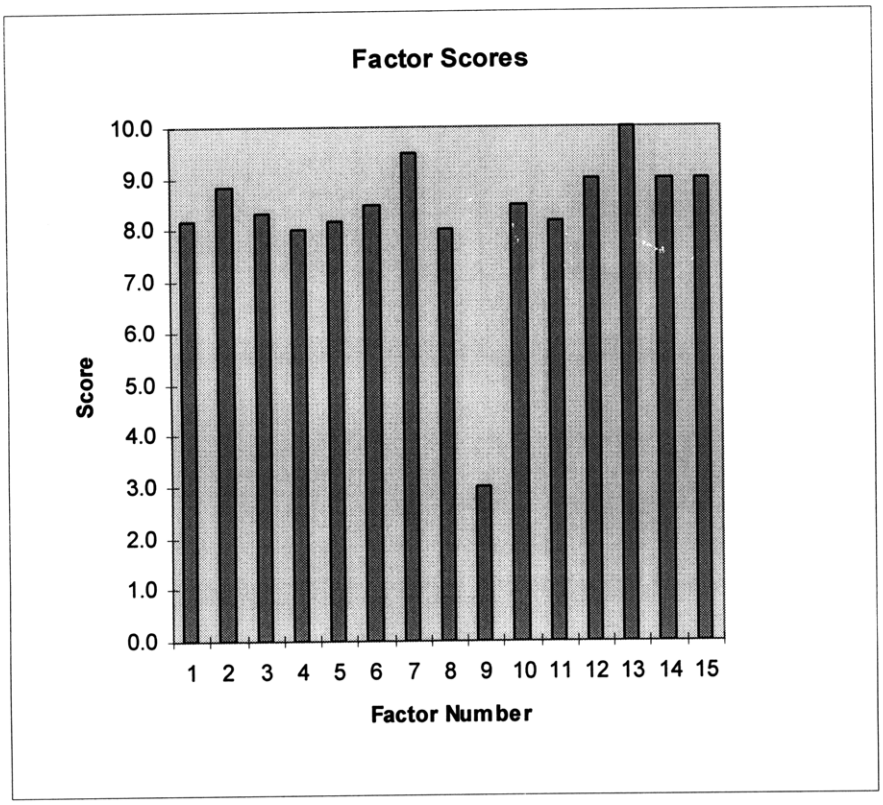

Figure 36. SAVE INFRATEST Factor Scores

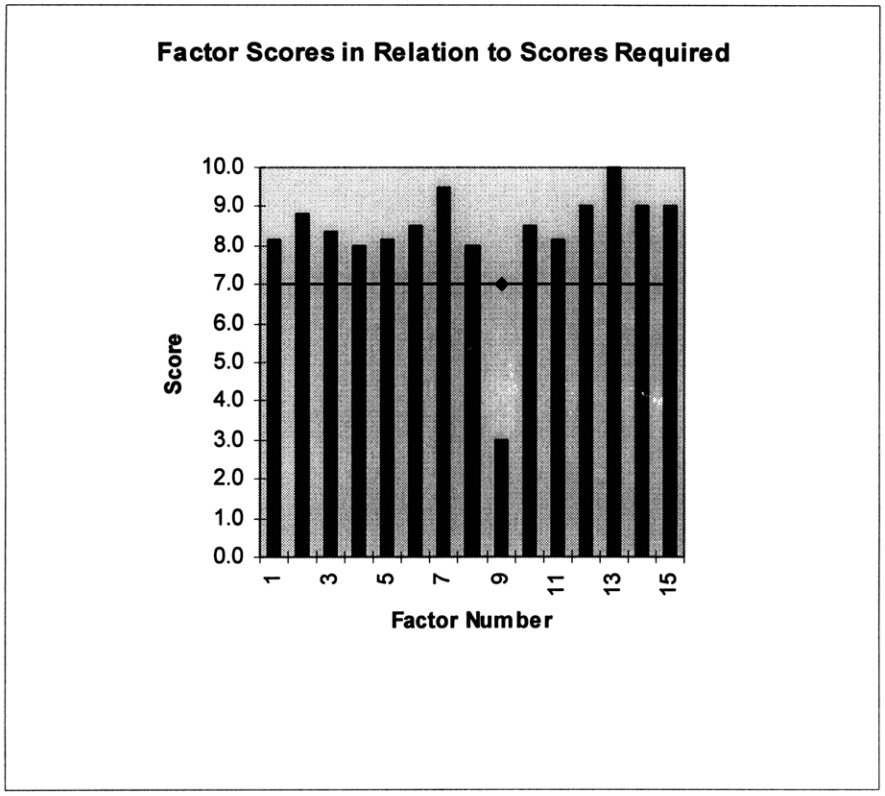

Figure 37. SAVE INFRATEST Factor Scores in Relation to Scores Required

Specific Factor		Contributing							
Name	Number	Factors	Contributing Factor Scores					Factor Score	Percentile
Business	1	1 thru 5	8.2	8.8	8.3	8.0	8.2	41.5	83%
Finance	2	6 thru 10	8.5	9.5	8.0	3.0	8.5	37.5	75%
Project	3	11 thru 15	8.2	9.0	10.0	9.0	9.0	45.2	90%

Figure 38. SAVE INFRATEST Specific Factor Percentiles

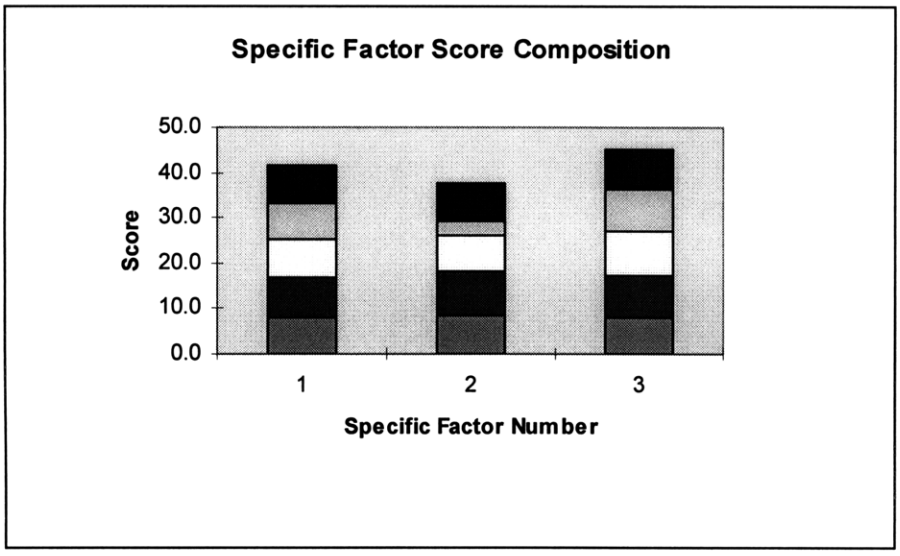

Figure 39. SAVE INFRATEST Specific Factor Score Composition

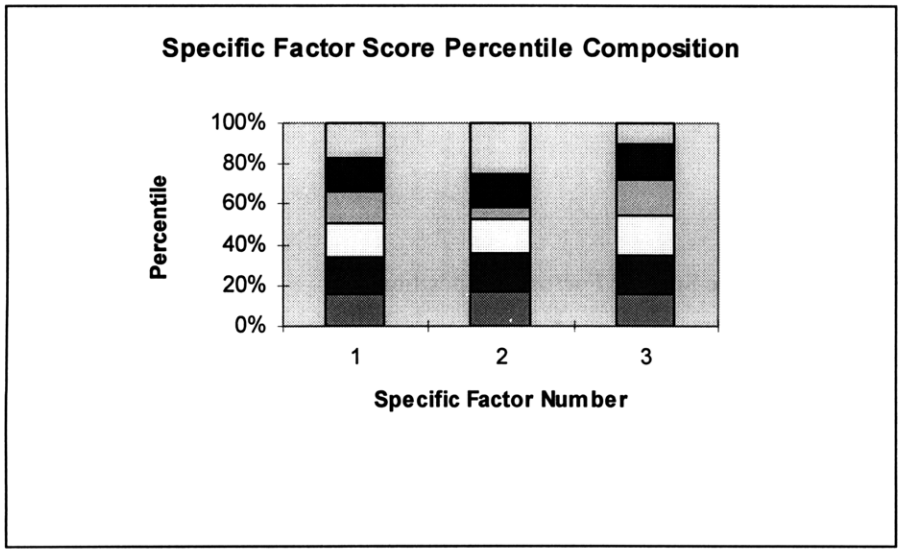

Figure 40. SAVE INFRATEST Specific Factor Score Percentile Composition

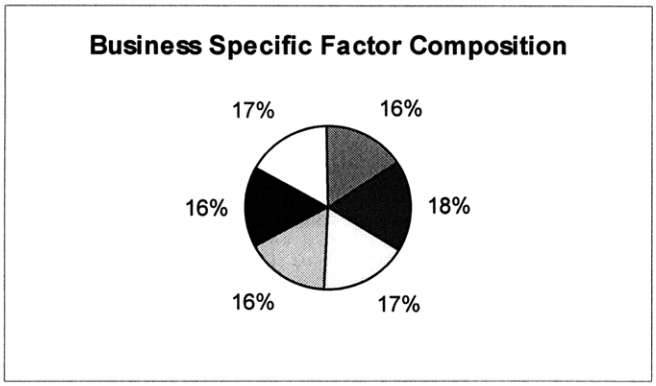

Figure 41. SAVE INFRATEST Business Specific Factor Composition

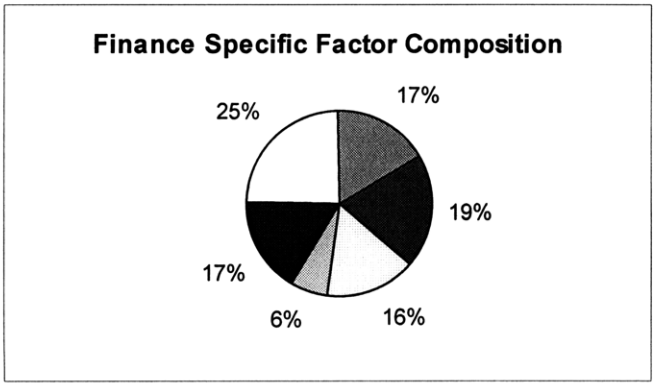

Figure 42. SAVE INFRATEST Finance Specific Factor Composition

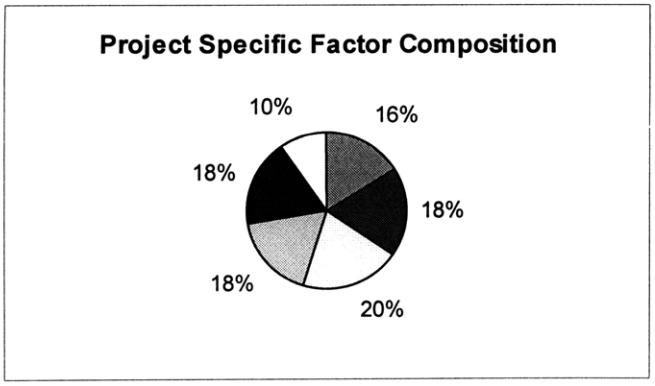

Figure 43. SAVE INFRATEST Project Specific Factor Composition

Contributing Specific Factor Scores			Overall Quality Rating	Percentile
41.5	37.5	45.2	124.2	82.8%

Figure 44. SAVE INFRATEST Overall Project Quality Percentile

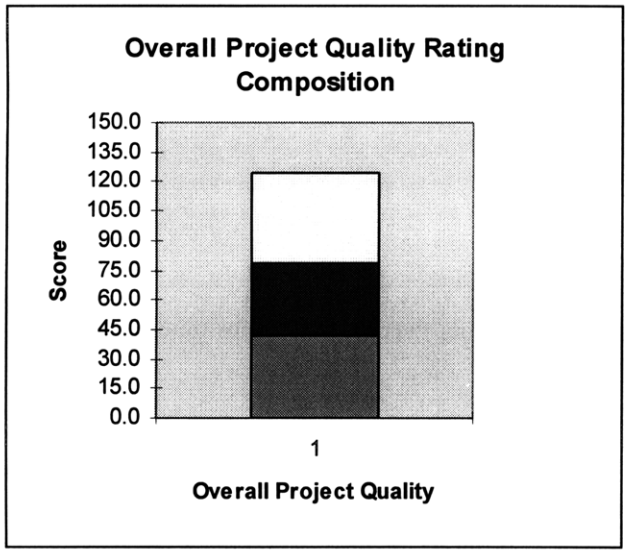

Figure 45. SAVE INFRATEST Overall Project Quality Rating Composition

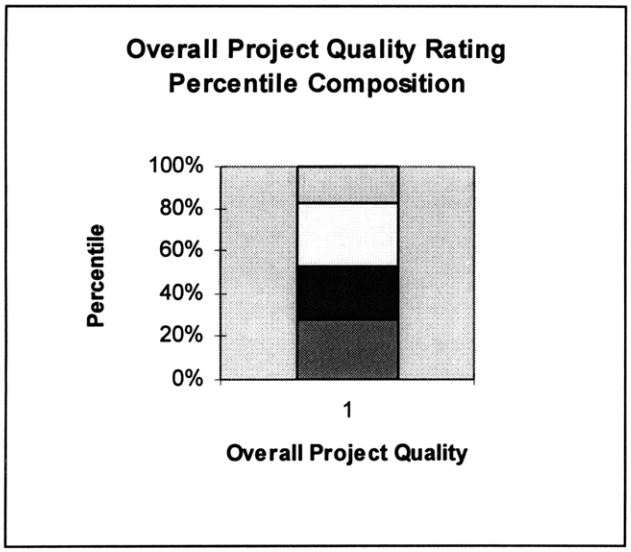

Figure 46. SAVE INFRATEST Overall Project Quality Rating Percentile Composition

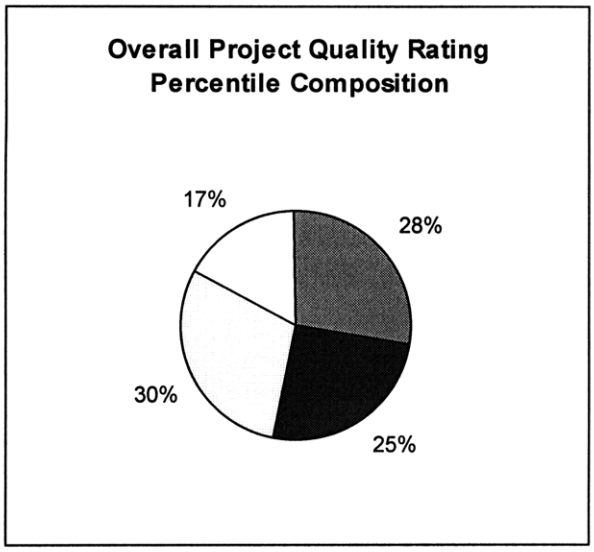

Figure 47. SAVE INFRATEST Overall Project Quality Rating Percentile Composition

Indictor Name	Indicator Number	Indicator Value	Indicator Value Required
Growth Phase	1	7.0	7.0
Economic Effects	2	7.5	7.0
Resource Effects	3	4.0	7.0
Demand Forecasts	4	7.5	7.0
Socioeconomics of Service Area	5	6.0	7.0
Infrastructure Network Position	6	7.5	7.0
Engineering Experience	7	3.0	7.0
Construction Experience	8	2.0	7.0
Operations Experience	9	1.0	7.0
Sales Position Trends	10	8.0	7.0
Operating Margin Trends	11	8.0	7.0
Past Performance	12	1.0	7.0
Current Control Tools	13	1.0	7.0
Future Planning	14	1.0	7.0
Normality of Accounting Practices	15	1.0	7.0
Depth of Demand Studies	16	9.0	7.0
Operating Margins	17	3.0	7.0
Return on Capital	18	4.0	7.0
Debt Service Ratio	19	1.0	7.0
Debt Service Schedule	20	1.0	7.0
Debt Service Reserve	21	1.0	7.0
Long-term Debt to Capitalization	22	4.0	7.0
Composite Evaluation of Financial Ratios	23	4.0	7.0
Financial Recourse	24	7.5	7.0
Creditworthiness of Developer	25	2.0	7.0
Finance Mechanism	26	4.0	7.0
Development Phase Risks	27	1.0	7.0
Delivery Phase Risks	28	4.0	7.0
Developer Power to Set Rates	29	9.0	7.0
Commitment to Environmental Considerations	30	1.0	7.0
Commitment to Technology Advances	31	5.0	7.0

Figure 48. Northumberland Bridge INFRATEST Indicator Results

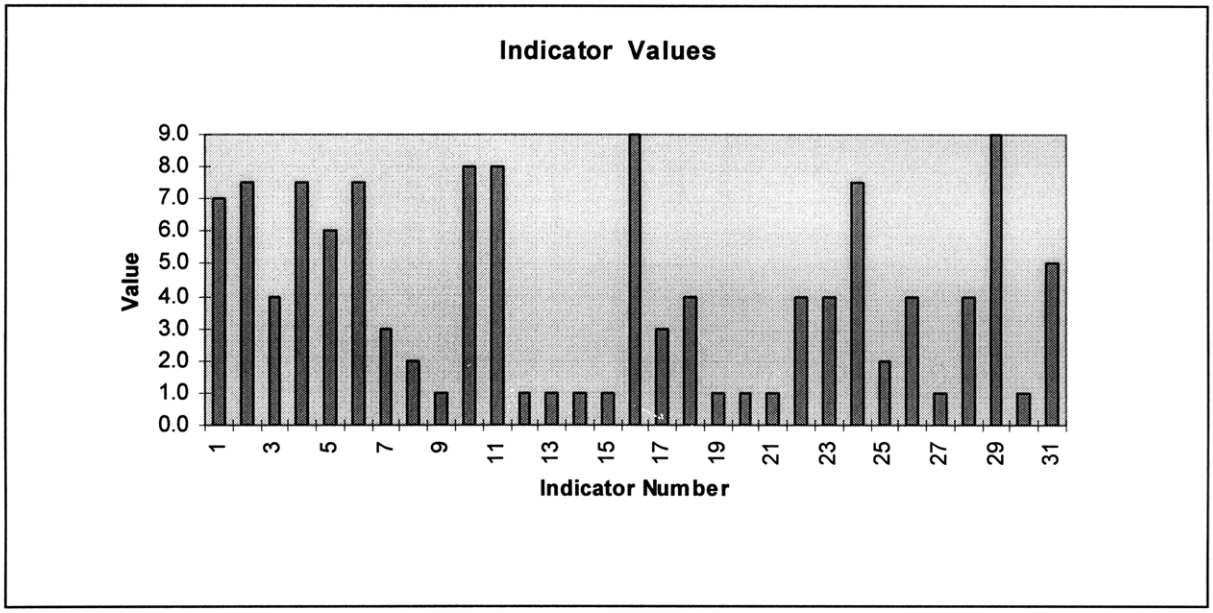

Figure 49. Northumberland Bridge INFRATEST Indicator Values

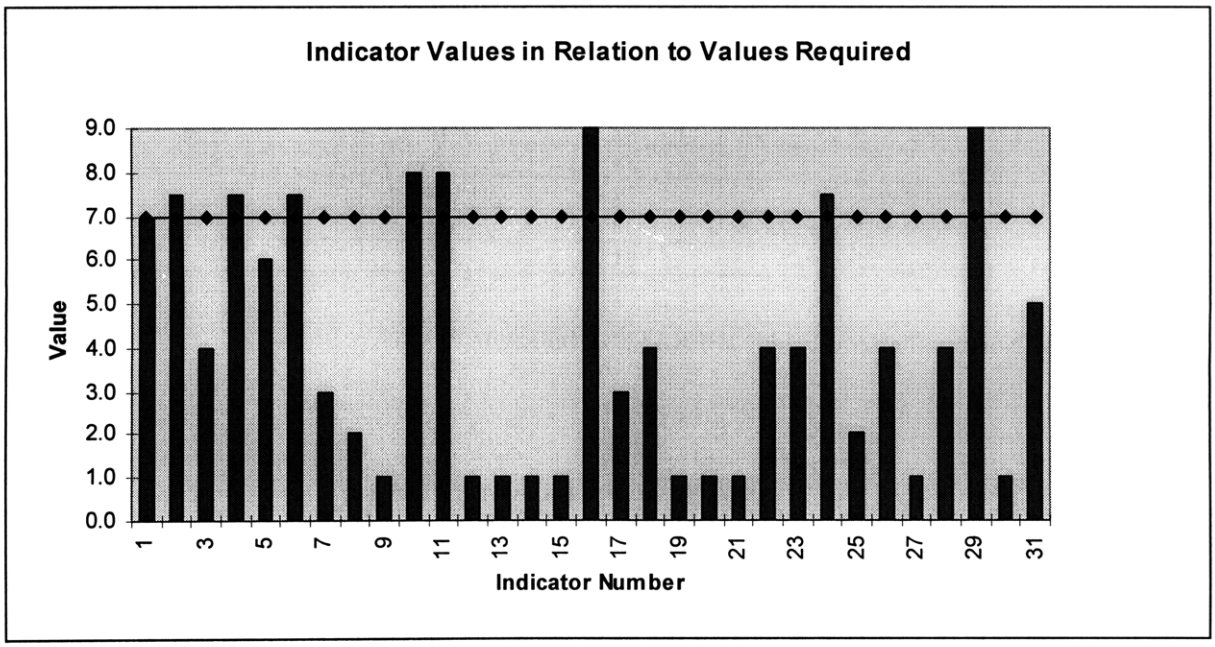

Figure 50. Northumberland Bridge INFRATEST Indicator Values in Relation to Values Required

Factor Name	Factor Number	Factor Score	Factor Score Required
Infrastructure Market Constitution	1	6.2	7
Service Territory Demand	2	7.0	7
Developer Infrastructure Industry Experience	3	2.0	7
Developer Industry Position	4	8.0	7
Developer Managment Characteristics	5	1.0	7
Financial Information Quality	6	5.0	7
Projected Earnings Stability	7	3.5	7
Debt Coverage Adequacy	8	1.0	7
Financial Leverage	9	4.0	7
Financial Flexibility	10	4.0	7
Financing Package	11	4.5	7
Completion Risk	12	2.5	7
Regulatory Climate	13	9.0	7
Project Environmental Merits	14	1.0	7
Project Technology Merits	15	5.0	7

Figure 51. Northumberland Bridge INFRATEST Factor Results

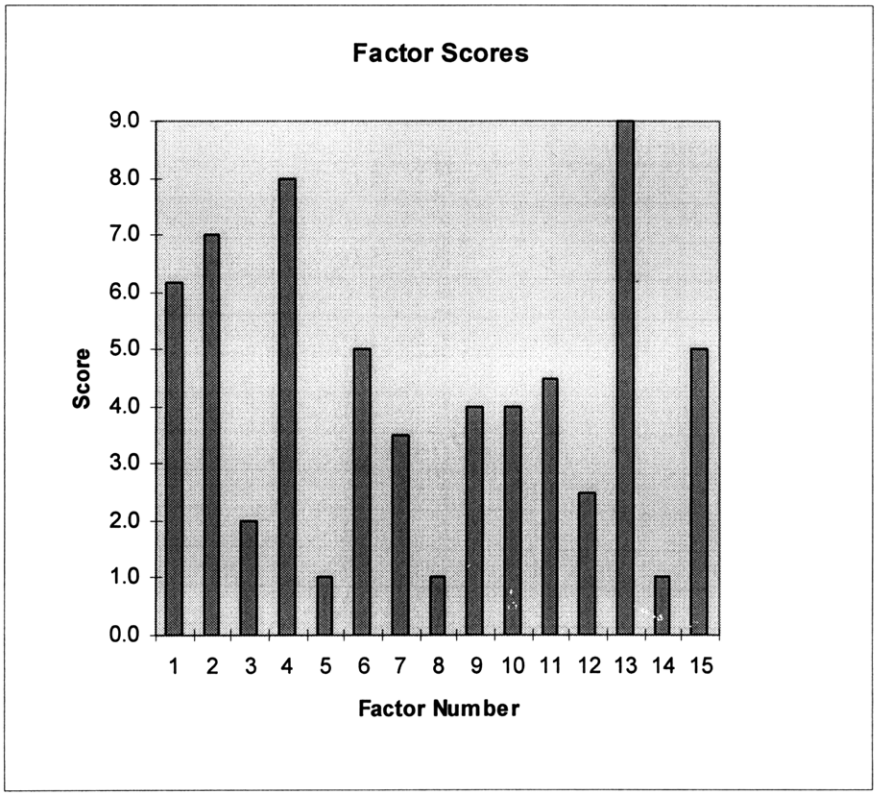

Figure 52. Northumberland Bridge INFRATEST Factor Scores

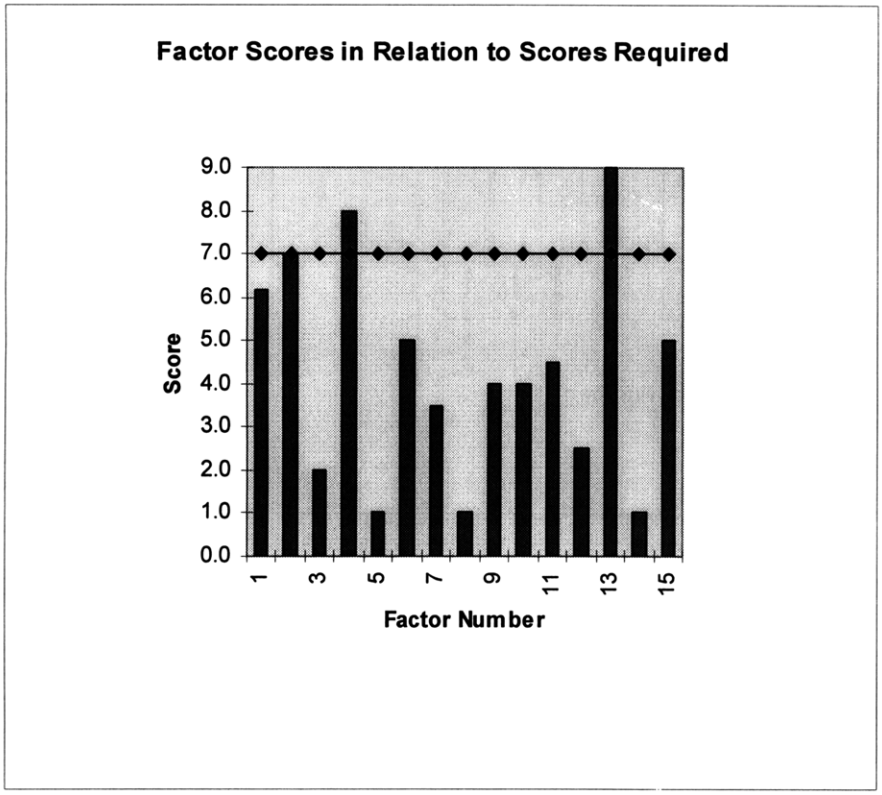

Figure 53. Northumberland Bridge INFRATEST Factor Scores in Relation to Scores Required

Specific Factor		Contributing							
Name	Number	Factors	Contributing Factor Scores					Factor Score	Percentile
Business	1	1 thru 5	6.2	7.0	2.0	8.0	1.0	24.2	48%
Finance	2	6 thru 10	5.0	3.5	1.0	4.0	4.0	17.5	35%
Project	3	11 thru 15	4.5	2.5	9.0	1.0	5.0	22.0	44%

Figure 54. Northumberland Bridge INFRATEST Specific Factor Percentiles

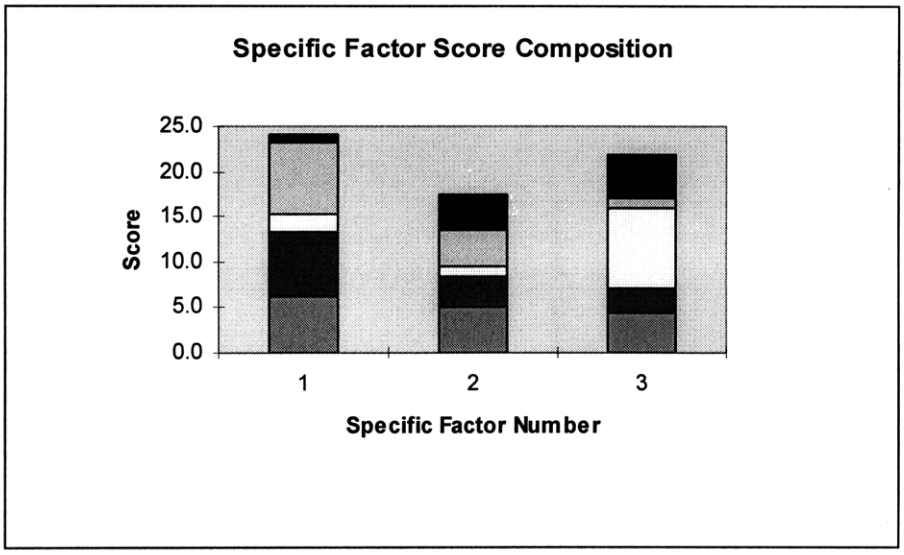

Figure 55. Northumberland Bridge INFRATEST Specific Factor Score Composition

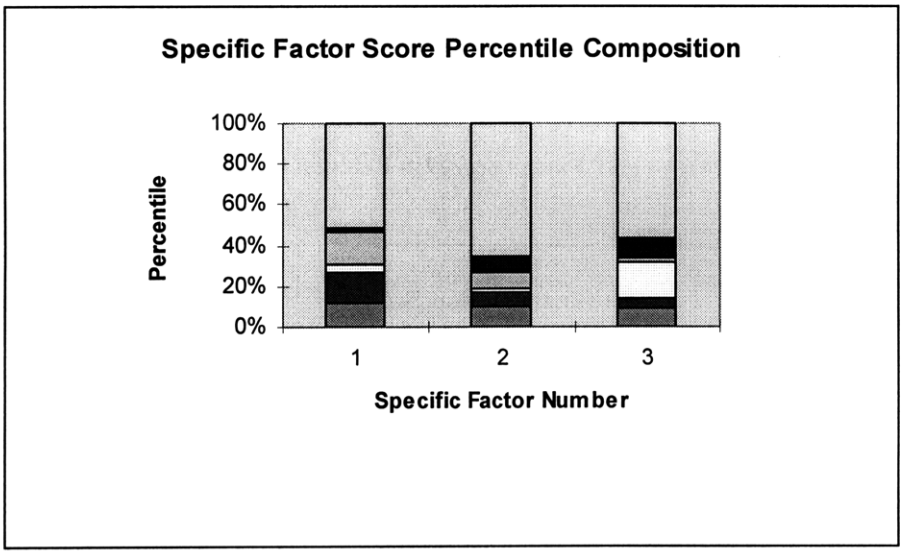

Figure 56. Northumberland Bridge INFRATEST Specific Factor Score Percentile Composition

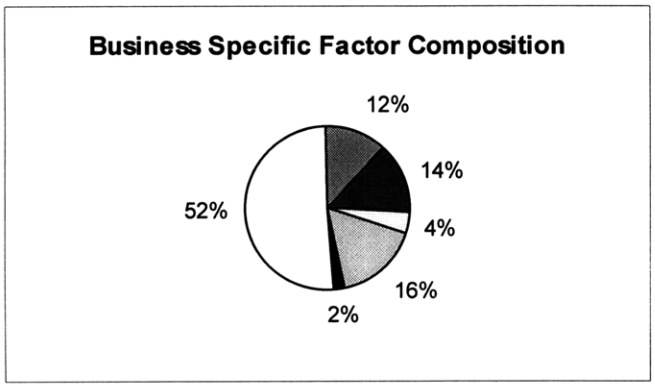

Figure 57. Northumberland Bridge INFRATEST Business Specific Factor Composition

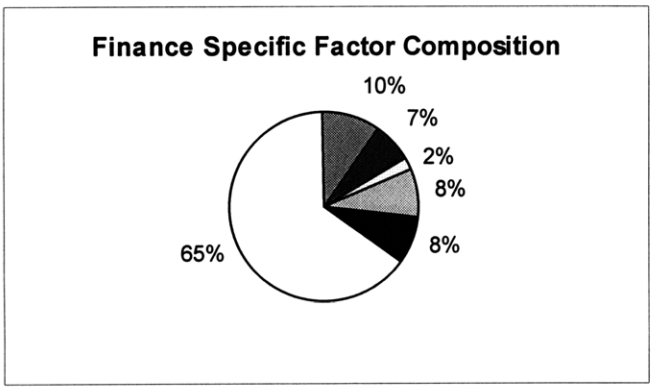

Figure 58. Northumberland Bridge INFRATEST Finance Specific Factor Composition

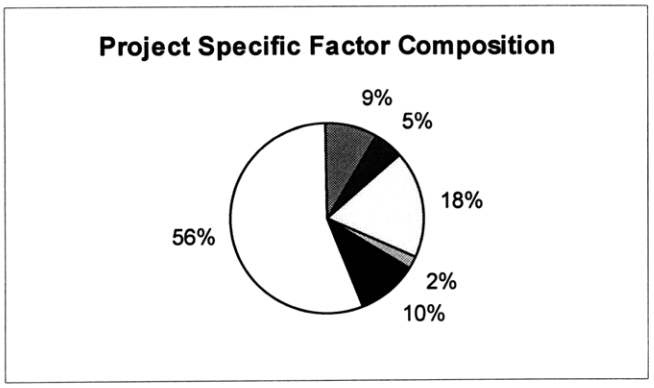

Figure 59. Northumberland Bridge INFRATEST Project Specific Factor Composition

Contributing Specific Factor Scores			Overall Quality Rating	Percentile
24.2	17.5	22.0	63.7	42.4%

Figure 60. Northumberland Bridge INFRATEST Overall Project Quality Percentile

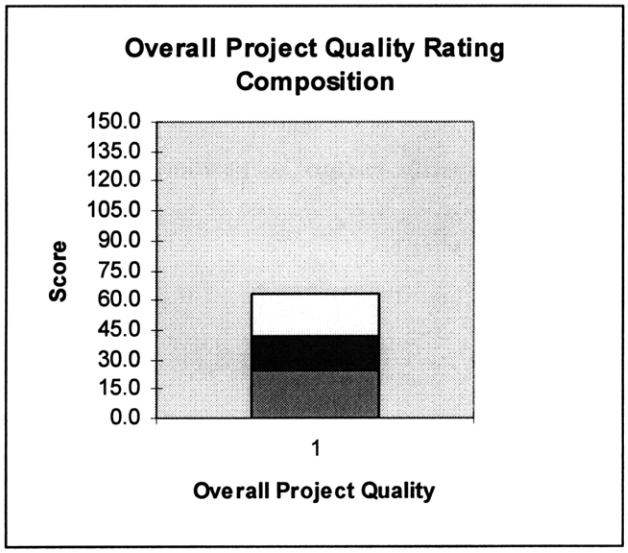

Figure 61. Northumberland Bridge INFRATEST Overall Project Quality Rating Composition

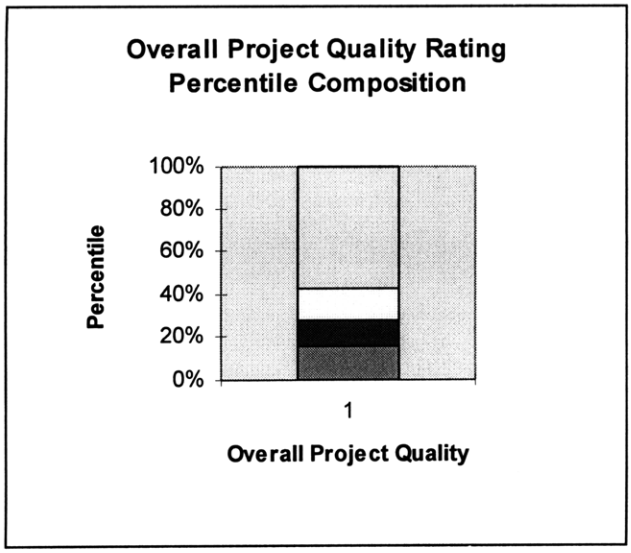

Figure 62. Northumberland Bridge INFRATEST Overall Project Quality Rating Percentile Composition

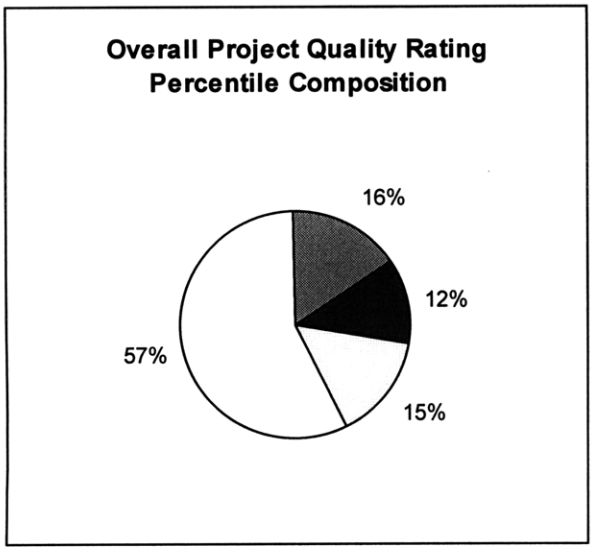

Figure 63. Northumberland Bridge Overall Project Quality Rating Percentile Composition

9. APPENDIX 1

Factor and Specific Factor Color Legend

Factor Name	Factor Number	Color
Infrastructure Market Constitution	1	
Service Territory Demand	2	
Developer Infrastructure Industry Experience	3	
Developer Industry Position	4	
Developer Managment Characteristics	5	
Financial Information Quality	6	
Projected Earnings Stability	7	
Debt Coverage Adequacy	8	
Financial Leverage	9	
Financial Flexibility	10	
Financing Package	11	
Completion Risk	12	
Regulatory Climate	13	
Project Environmental Merits	14	
Project Technology Merits	15	

Specific Factor Name	Color
Business	
Finance	
Project	

IPQAM Checklist
Business Specific Factors
Santa Ana Viaduct Express (SAVE)

Factor	Indicator		Insufficient	Project	Indicator
#	#	Title	Information	Information	Value
1	1	Growth Phase		-Privatization of transportation infrastructure holds much promise -At brink of opening market, inadequate public funds, increasing realization of private sector cost and time efficiencies	8.5
	2	Economic Effects		-Unrealized market potential, new market, few projects -View roads as consumer product, w/ price get better quality road -many uncertina factors of demand, non-essential service	7.5
	3	Resource Effects		-Not prone to labor and material shortages and difficulties of supply, as long as domestic	8.5
2	4	Demand Forecasts		-5%-7% reductions in traffic and vehicles miles of travel w/ SAVE -Annual traffic growth of area from -0.6% to 5.2%, average is 1.8%	8.5
	5	Socioeconomics of Service Area		-Sizable, wealthy service area high per capita incomes, strong employment, population growth, noteworthy tourist, sports, retail, and commercial destinations / complexes	9.0
	6	Infrastructure Network Position		-Provides long planned missing link completing central regaional transportation system of Orange County, part of Regional Mobility Plan, multi-modal potential also	9.0
3	7	Engineering Experience		-Greiner has been in business of primary surface consultant since 1908, $15 billion of highway, bridge projects, 50 major toll projects -Pioneer in development of interstate highway design criteria	9.0
	8	Construction Experience		-Kiewit Pacific Co. has been in business since 1884, 18th ENR top contractors, reputation for rigorous, complex, diff. projects -Prime for first BOT toll road in U.S.. $1.4 billion in constr.	10.0
	9	Operations Experience		-Perot Group commitment to quality, great financial resources -Business of land development . . . different focus on growth potential and business needs, Alliance Airport, private highways	6.0
4	10	Sales Position Trends		-No specific information -Passed Caltrans RFQ criteria, above industry standards	8.0
	11	Operating Margin Trends		-No specific information -Passed Caltrans RFQ criteria, above industry standards	8.0
5	12	Past Performance		-No specific information -Passed Caltrans RFQ criteria, above industry standards	8.0
	13	Current Control Tools		-No specific information -Passed Caltrans RFQ criteria, above industry standards	8.0
	14	Future Planning		-Expression of commitment to quality, firms of consortium are at forefront of their respective industries . . . evidence of excellent future planing, goals setting and evaluation	8.5

IPQAM Checklist
Finance Specific Factors
Santa Ana Viaduct Express (SAVE)

Factor #	Indicator #	Indicator Title	Insufficient Information	Project Information	Indicator Value
6	15	Normality of Accounting Practices		-Cash flow analysis completed by The First Boston Corporation -International investment bank, experience with introducing new transportation facilities to capital markets, solid reputation	8.0
	16	Depth of Demand Studies		-Traffic demand forecasts use most recent population and job data from S. California: income, housing, travel -Toll revenue forecasted with advanced econometric principles	9.0
7	17	Operating Margins		-See spreadsheet analysis from cash flow numbers	10.0
	18	Return on Capital		-25.1% return on long-term equity invested to replace constr. loan -paid after operations, sr. debt, and jr. debt --riskiest of long-term investments, only considers toll revenue.	9.0
8	19	Debt Service Ratio		-Cash flow model assumes 1.3x sr. debt covereage, 1.3x jr. debt coverage, these coverages are set to figure the amount of total debt based on forecasted toll revenue	9.0
	20	Debt Service Schedule		-Set at level 1.3x debt service with variable maturities, sinking fund schedules, and partial amortization with expectation to refinance before balloon payment	7.5
	21	Debt Service Reserve		-Cash flow model assumes 10% of total bonds issued for debt reserve, this comes out to be 0.90 sr. debt service	7.5
9	22	Long-term Debt to Capitalization		-15% long-term equity contribution, may be higher if strong interest in project	3.0
10	23	Composite Evaluation of Financial Ratios		-No undesignated reserve fund, but consortium is financially strong, ease of entry into short-term capital markets, pledge of contingency equity contributions if necessary	8.5

IPQAM Checklist
Project Specific Factors
Santa Ana Viaduct Express (SAVE)

Factor	Indicator		Insufficient	Project	Indicator
#	#	Title	Information	Information	Value
11	24	Financial Recourse		-Non-recourse project, high motivation of developer to ensure timely and full debt service, project success means more private infrastructure development work	7.5
	25	Creditworthiness of Developer		-The Perot Consortium possesses financial strength to ensure project completion/operation, compeled by future private infra. prospects, fund total of pre-constr., long-term equity participation	9.0
	26	Finance Mechanism		-Combination of senior lien toll road bonds, subordinated lien toll road bonds, and long-term equity, long-term equity from consortium members, high net worth investors, local businesses	8.0
12	27	Development Phase Risks		-Broad community support, in most regional plans for 20 years -Vast portions of right-of-way under public ownership -Reduced environmental permitting from SARP studies	10.0
	28	Delivery Phase Risks		-Fast-track design-build, creative sequencing/overlapping tasks -Not secured construction financing until fixed price contract -Mitigate delays with increased manpower and coordination	8.0
13	29	Developer Power to Set Rates		-Complete authority to set toll rates per pricing congestion market share concepts	10.0
14	30	Commitment to Environmental Considerations		-Reduced congestion, reduces air pollution, smog, and use of fossil fuels, enhanced regional air quality no start/stop traffic -Noise and aesthetic considerations in SAVE design, location	9.0
15	31	Conmmitment to Technology Advances		-State-of-the-art ETC and AVI toll systems for congestion pricing and traffic management, TollTag system with vehicle tags, scanners, computer for billing and data for toll pricing	9.0

IPQAM Checklist
Business Specific Factors
Northumberland Bridge

Factor #	Indicator #	Indicator Title	Insufficient Information	Project Information	Indicator Value
1	1	Growth Phase		-Western gov. trend for private ownership, English Channel -Transfer fin. risk to priv. sector, away from debt-burdened public	7.0
	2	Economic Effects	X		7.5
	3	Resource Effects		-Atlantic Canada's small economy; Northumberland represents large material, labor demands, significant economic importation	4.0
2	4	Demand Forecasts		-2.5% annual increase in private cars (with Northumberland) -2.0% annual increase in trucks (with Northumberland) -But, downward historic growth trend	7.5
	5	Socioeconomics of Service Area		-Population, labor force, personal income, housing starts stats -General economic indicators are promising, sound social stats	6.0
	6	Infrastructure Network Position		-Integral part of existing system, although existing may need to upgrade to match Northumberland capacity, potential for Northumberland to be too large capacity for rest of system	7.5
3	7	Engineering Experience	X	-Northern Consultants (part of Strait Crossing Develop. Consort.) subsidiary of Morrion-Knudsen --large engineering construction group	3.0
	8	Construction Experience	X	-GTMI (part of Strait Crossing Develop. Consort.) engineering and construction firm, global large scale experience -Ballast Nedum, international construction group	2.0
	9	Operations Experience	X	-Strait Crossing Development, Inc.	1.0
4	10	Sales Position Trends	X		8.0
	11	Operating Margin Trends	X		8.0
5	12	Past Performance	X		1.0
	13	Current Control Tools	X		1.0
	14	Future Planning	X		1.0

IPQAM Checklist
Finance Specific Factors
Northumberland Bridge

Factor #	Indicator #	Indicator Title	Insufficient Information	Project Information	Indicator Value
6	15	Normality of Accounting Practices	X		1.0
	16	Depth of Demand Studies		-Almost a decade of economic viability studies which documnet consistent demand. Existing ferry traffic information is accurate source for traffic forecasts	9.0
7	17	Operating Margins	X	-Income will be from two sources: toll revenue and gov. subsidy in an amount not to exceed current ferry costs (C$42 million) -No maintenance costs estimaed	3.0
	18	Return on Capital	X	-Need maintenance costs, toll revenue can be accurately forecasted using ferry traffic info and ferry traffic tolls, gov. subsidy of C$42 million (guaranteed portion of revenue)	4.0
8	19	Debt Service Ratio	X		1.0
	20	Debt Service Schedule	X		1.0
	21	Debt Service Reserve	X		1.0
9	22	Long-term Debt to Capitalization	X	-Total cost of C$840 million will be financed with debt and equity -No info as to structure of finance and proportion of equity	4.0
10	23	Composite Evaluation of Financial Ratios	X	-C$42 million provides some measure of financial operating flexibility	4.0

IPQAM Checklist
Project Specific Factors
Northumberland Bridge

Factor	Indicator		Insufficient	Project	Indicator
#	#	Title	Information	Information	Value
11	24	Financial Recourse		-Non-recourse, revenue from toll and government subsidy -Strait Crossing Development, Inc. firms have motivated interests to gain entry into privatization market	7.5
	25	Creditworthiness of Developer		-Northern Consultants, GTMI, and Ballast Nedum are global companies with strong financial resources, however, no commitments for contingency equity infusioins	2.0
	26	Finance Mechanism	X	-C$42 million will mitigate some revenue risks, lowers interest rate -No information regarding capital structure proposed	4.0
12	27	Development Phase Risks	X		1.0
	28	Delivery Phase Risks		-Construction during very harsh winter season over icy water	4.0
13	29	Developer Power to Set Rates		-Developer can set rates at maximum of current ferry tolls, can be adjusted yearly with increase not to exceed 75% of CPI	9.0
14	30	Commitment to Environmental Considerations	X		1.0
15	31	Conmmitment to Technology Advances		-Minimal application of new bridge design technology -Conical ice shields at piers, precast spans fabricated on site, moved with hydraulic sleds, placed with floating crane	5.0

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