NATIONAL ANNUITY CORPORATION: INTERSTATE HIGHWAY PRIVATE EQUITY

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This exercise case involves the analysis of a potential public-private partnership (P3) investment opportunity focused on constructing an interstate highway bypass in the Chicago area. Students are tasked with formulating a comprehensive list of due diligence questions, calculating the project's Internal Rate of Return (IRR), and providing a recommendation to a managing director regarding the feasibility and desirability of further exploring this investment opportunity.

Public-Private Partnerships (P3s)

A P3 is a collaborative arrangement between a public-sector entity (such as a government agency) and a private consortium (such as a private entity). The goal is to jointly develop, finance, operate, and maintain infrastructure projects including transportation, energy, water, and other infrastructure. The public sector provides regulatory oversight, land, and often some funding, whereas the private sector contributes capital, expertise, and operational efficiency. P3s distribute risks and responsibilities between the public and private partners, allowing each party to leverage its strengths (Hakim, Clark & Blackstone 2022; Reinhardt 2011).

The authors developed the exercise for class discussion rather than to illustrate either effective or ineffective handling of the situation. The exercise and its accompanying instructor's manual were anonymously peer reviewed by the ***Journal of Case Research and Inquiry***, a publication of the Western Casewriters Association. Qualified educators may request the instructor's manual at editor@jcri.org. Contact Seung Hee Choi, 2000 Pennington Rd, Ewing Township, NJ 08618, USA, choi@tcnj.edu

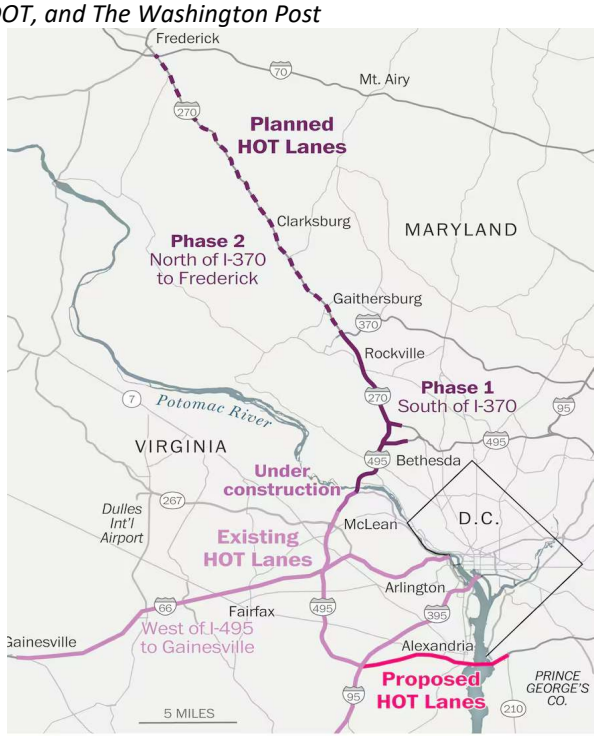
Background and Development

The COVID-19 pandemic significantly changed business conduct in America, leading to increased remote work and declining public transportation use due to health concerns. Consequently, car usage rose, resulting in traffic congestion on Illinois city streets. To address this, Illinois identified the need for a multilane highway to reduce congestion and expedite commuter travel (Pandey, Alamri, Khoury & Bakre 2022). However, funding the project posed a challenge due to the state's high public debt and recently improved credit rating from BBB. While additional debt could potentially jeopardize the credit rating upgrade, it is important to note that each debt issue is rated independently. Therefore, even if the new debt issue affects Illinois' overall credit rating, the cost of the issue itself might remain competitive.

Illinois recognized that privately built projects were often completed on time and within budget. Researching successful privately owned express toll lanes in Washington, DC, and on Interstate 77 outside Charlotte, NC, Illinois considered finding a private company to finance and oversee the project. Florida had recently accomplished a similar project by contracting with a large investment company to build an interstate highway that did not charge tolls, with the state paying an annual fee for several years before the highway reverted to state ownership. One potential company with a proven track record in such projects is the National Annuity Corporation (NAC).

Exhibit 1. Washington, D.C.'s Capital Beltway/Interstate highway connectors

Sources: Maryland DOT, Virginia DOT, and The Washington Post



For the exercise, students are tasked with formulating due diligence questions, calculating the project's feasibility through IRR, understanding the significance of IRR, and providing a recommendation to a managing director on whether to pursue this investment opportunity. The exercise allows students to apply theoretical knowledge to real-world scenarios, develop financial analysis, strategic decision-making, and demonstrate understanding of the dynamics of public-private partnerships.

National Annuity Corporation (NAC)

National Annuity Corporation (NAC) is one of the premier 401k pension fund managers in the United States. It receives funds daily that were withheld from employee paychecks by client corporations in each of the fifty states. It also receives matching contributions from employers. Upon retirement, employees have the option of receiving a lump sum payout, an annuity, or some combination of the two. Given the tax implications of a lump sum payout, almost all of the employees opt for a monthly payout.

NAC has groups that invest in publicly traded stocks, publicly traded bonds, real estate, high risk securities, natural resources, private equity, and private placements. In the past, the group investing in natural resources (agriculture, lumber, mining, and fisheries) has been the high performing division. Investments in infrastructure have been a popular way to achieve diversification benefits since the 1950s. In fact, at the time of the American Revolution, most infrastructure was privately owned, providing returns to investors while under state regulations. Infrastructure investments have consistently provided steady, reliable returns across various economic conditions (Andonov, Kraeussl & Rauh 2021).

Prior to retirement, an employee can direct how his or her funds are to be invested. When the stock market, such as the S&P 500, is rising, more funds are typically invested in publicly held equities. When the market is in decline, bonds and private placements gain favor. Upon retirement, many employees opt for an annuity, leaving NAC free to invest these funds where the firm believes they can earn the highest return. For several years, the portfolios of the natural resources and infrastructure groups - such as the Vanguard Real Estate ETF (VNQ), which invests primarily in real estate and infrastructure assets within the United States - has outperformed the S&P Global Infrastructure Index and the S&P 500 Index (Carlo, Kok & Wijnands 2023; Vanguard 2024).

NAC has over one trillion dollars under management. Each year approximately $50 billion must be reinvested. In addition to this amount, about $5 billion of new money is transferred to NAC. There is tremendous pressure to get money out the door for new investments. The heads of each investment group campaign for their *"share"* of the new investment pool of funds. NAC guarantees its clients a minimum of a 3% return. It also has an internally imposed expense ratio of .75%. Thus, the breakeven investment must earn 3.75%. This rate is frequently higher than the Federal Funds rate.

Need for Highway Construction Investment

Illinois found that a shift in employment opportunities to the outskirts of Chicago as a result of COVID-19 in conjunction with a surge of residential construction altered rush hour traffic patterns. An increased volume of traffic placed a burden on roads that were originally designed for local traffic. The proposed new road could reduce commute time by at least twenty minutes in the morning and evening while easing local traffic congestion. The proposed bypass would cut through a blighted area that has long been an eyesore. Rather than facing community resistance, the proposed construction project was warmly received by nearby residents.

The Illinois Department of Transportation announced a request for proposals (RFP) for the construction of an Interstate highway to be built as part of a bypass around Chicago. This would be an eleven-mile road with an approximate price tag of $1.1 billion. It would be a toll-free road. Illinois already had condemned all property in the path of the road. In return for constructing and maintaining the road, Illinois was willing to pay the equity investor $89 million (inflation adjusted) a year for thirty years. Twelve construction companies submitted proposals for the project and Illinois narrowed down the list of potential developers to five. Some potential construction companies were eliminated because they had never worked on a project of this size. Others were not considered financially stable enough to carry the project to completion.

Why doesn't Illinois build the road itself? The obvious answer is that it did not have the money and could not budget such an expense. Illinois' financial situation was such that its current credit rating would justify a high interest rate. It is also a known fact that private construction moves at a faster rate than projects constructed by governments.

Since the stream of repayment funds is considered relatively risk-free, projects of this type are normally ninety percent leveraged. A project of this magnitude will cost more than one billion dollars, the construction company with the winning bid needs a financial investment partner.

This potential investment has been brought to the private equity infrastructure group (PEIG) of NAC. Private Equity Infrastructure Groups (PEIGs) are firms that specialize in investments across various infrastructure sectors. These sectors include energy, transportation, infrastructure, and water and waste management. By focusing on these areas, PEIGs aim to provide capital and expertise to support and grow essential infrastructure projects. Examples of the type of projects this group funds include private fiber optic networks, express toll lanes on interstate highways, gas transmission plants, and wind farms. Such groups funds large projects and in the process, become the major (if not the only) stockholder in the venture. If PEIG is the investment partner on this project, it must find other potential lenders. PEIG has a private placement group, but it is viewed as a conflict of interest to be both an equity holder as well as a lender to the same undertaking. If PEIG is interested in obtaining an equity position in a project, it must pair with one of the five construction companies that remain in the running. As luck would have it, PEIG had previously partnered with one of the five construction companies on four previous projects. On top of this, it must secure commitments from other private placement companies for approximately one billion dollars.

These details include items such as cost ($1.1 billion), timeline for construction (4 years), timeline for operation of the project (30 years commencing from the date the contract is awarded), and the exit strategy for PEIG. In this case the highway will be turned over to Illinois after thirty years.

The construction company expects a 5% equity ownership but is not expected to invest any of its own capital (funds) in the project. The reason for not considering this investment opportunity would be the perceived credit rating of the entity that will eventually purchase the equity created by the investor. Other reasons for not considering an investment project include

political risk, cost, estimated internal rate of return (IRR), availability of investible funds, and a lack of firm knowledge of the type of proposed undertaking.

The project under consideration involves the construction of an interstate highway around Chicago. Illinois has already condemned all property in the path of this road. In return for constructing and maintaining the road, Illinois is willing to pay the investor $89 million a year for thirty years. The investor would be responsible for routine maintenance of the roadway for the thirty-year duration. Maintenance includes such items as general upkeep of the road, snow plowing, removal of cars in case of an accident, insurance, functioning streetlights, etc.

Exhibit 2. Project Details

Project Cost	$1.1 billion
Annual Payment to Investor	$89 million (inflation adjusted)
Project Duration	30 years
Construction Timeline	4 years
Potential Reduction in Commute Time	20 minutes (morning and evening)
Equity Ownership of Construction Company	5%
Leverage Ratio	90% leverage

Feasibility Study

Illinois has agreed to pay $89 million a year for thirty years, provided that equity holders maintain the highway to Illinois stated specifications beginning upon completion of the highway. The $89 million amount is not tied to the amount of traffic that uses the highway. The annual payment would be adjusted each year in accordance with the rate of inflation. PEIG has found a highway maintenance company that will maintain the roadway for $8 million a year, a fee that will also be adjusted for inflation.

Maintenance will be contracted for twenty-six years and will commence when the highway construction has been completed. Administration of this undertaking is expected to cost $1 million a year. For cash-flow purposes, assume these payments are made at the end of the year. Insurance on the highway is also expected to be $1 million a year. For cash-flow purposes assume these payments are made at the beginning of the year. Both figures will be adjusted annually as the cost-of-living changes.

Private placement lenders expect an interest rate of 200 basis points (2%) over the average return on twenty- and thirty-year US government bonds. That average rate is currently 3.75%. Given the structure of this project, the private placement firms will receive four annual interests only payments while the road is under construction. After construction is completed, a constant annual payment of interest and principal will be paid at the end of each year for twenty-six years. There will be no balloon payment at the end of the thirty years. The private placement firms, as a group, are expected to invest $247.5 million at the beginning of the first, second, third, and fourth years, for a total of $990 million investment. By having the private placement firms make four installments, this will reduce interest costs and provide time to raise the funds to invest in this project. PEIG, if it is the successful equity investor, will fund $110 million at the start of the construction. This will show the private placement investors that it has some *"skin"* in the game should problems arise early on.

The construction company expects to receive 5% equity in this project and thus 5% of the potential returns. The returns to the construction company commence once the road is completed and Illinois has made its first inflation-adjusted $89 million payment at the end of the first year. At the end of the thirtieth year, the successful private equity firm and construction company will turn the highway over to the state of Illinois, and all payments will cease.

Exhibit 3. Overview of Financial and Operational Inputs

Annual Payment to Investor	$89 million (Inflation-adjusted)
Payment Duration	30 years
Payment Start	Upon highway completion
Inflation Adjustment	Annual payments adjusted for inflation
Maintenance Cost	$8 million per year
Maintenance Duration	26 years
Administration Cost	$1 million per year
Administration Payment Timing	End of each year
Insurance Cost	$1 million per year
Insurance Payment Timing	Beginning of each year
Interest Rate for Private Placement	2% over 3.75% (US govt. bonds average rate)
Construction Payments to Private Placement	$247.5 million at the beginning of years 1, 2, 3, and 4 Total: $990 million
PEIG Investment at Start	$110 million
Construction Equity	5% equity ownership
Returns Commencement	Upon first $89 million payment from Illinois
Total Investment	$1.1 billion

Your Assignment

Ava Gardner is a managing director in PEIG. She has asked you, a senior analyst, to help her make a recommendation to her boss (the Chief Investment Officer) as to whether PEIG should further explore this investment opportunity or move on to other potential investment opportunities.

If it agrees to go forward, PEGI would invest ten percent of the total cost of this project. As a first step, Ava wants you to compile a list of due diligence questions. Additionally, she wants you to determine the most likely internal rate of return if PEIG should undertake this highway project as well as your recommendation assuming no cost-of-living increases. In determining the IRR, assume $247.5 million will be invested at the beginning of each of the first four years to cover construction costs. Insurance and administration expenses will be paid at the beginning of each year.

It is Monday morning and Ava wants your analysis completed before you leave for the weekend. She has a meeting with the CIO scheduled for 10:00 next Monday. She wants to look over your recommendations over the weekend. Both your and Ava's annual bonuses are a substantial portion of your compensation. If Ava's meeting with the CIO leaves her saying, *"Gee, I never thought of that,"* both of you will suffer come bonus time.

Exhibit 4. Excel Template

Consider setting up an Excel Spreadsheet that looks like the following (Dollars in millions)

	T = 0	T=1	T=2	until T =30
Construction cost				
Interest and principal payments				
Insurance payments				
Administrative cost				
Maintenance expense				
Payments from Illinois				
Payment to construction company				
(5% of $89 million)				
Est. Inflation Rate				
Cash flow				

The internal rate of return (IRR)

IRR, which stands for internal rate of return, serves as a crucial financial metric for evaluating the potential profitability of investments. It represents the annual growth rate that an investment is expected to generate. Investors utilize IRR to evaluate the potential return on different assets. The fundamental principle underlying the internal rate of return (IRR) is to

equate the net present value (NPV) of all cash flows to zero within a discounted cash flow analysis. In essence, this concept involves determining the discount rate at which the present value of annual nominal cash inflows equals the initial net cash outlay for the investment.

Calculating the internal rate of return (IRR) entails determining the discount rate that results in a net present value (NPV) of zero. Given its iterative nature, the IRR function in Excel is often utilized to carry out precise calculations.

The formula for IRR is as follows:

$$0 = NPV \sum_{t=1}^{T} \frac{C_t}{(1+IRR)^t} - C_0$$

Where,

C_t=Net cash inflow during period t
C_0=Total initial investment cost
IRR = Internal Rate of Return
t = Number of time periods

The internal rate of return takes into consideration the time value of money, making it a valuable tool for evaluating capital budgeting projects. It offers a single measure for comparing various investment opportunities. Specifically, when comparing similar investments, a higher IRR generally indicates a more attractive project. However, students must understand that the IRR assumes the reinvestment of cash flows at the same rate, which may not always be realistic.

Additionally, complex cash flow patterns can lead to multiple solutions, known as multiple IRRs. It's also crucial to note that IRR doesn't factor in the scale of investment or project size. Moreover, while it is often correct that a higher IRR indicates a more attractive project, this statement does not hold true in all cases. For instance, if the cash flow pattern is inverse (*i.e.*, a cash inflow is followed by a series of cash outflows), the comparison becomes inaccurate.

Therefore, it is important to consider the specific cash flow patterns when using IRR for investment evaluations.

While IRR serves as a valuable metric for assessing the potential profitability of an investment, it's imperative to complement its use with an evaluation of other pertinent factors during the decision-making process. Factors such as the associated risks, opportunity costs, and specific economic and industry trends should be considered alongside IRR to make well-informed investment decisions. By taking a comprehensive approach that considers a wide array of variables, investors can gain a more holistic understanding of the potential outcomes and risks associated with any investment opportunity, thereby making informed and effective decisions for their portfolios.

Evaluating Infrastructure: IRR, Risks, and Strategic Funding

- How does the Internal Rate of Return (IRR) account for the impact of inflation on future cash flows when calculating the project's IRR?
- How can we assess the potential risks, financial impacts of delays, community reactions, and the state's financial stability when evaluating large infrastructure projects?
- What general questions should be asked to assess the feasibility, reliability of involved parties, and overall management capability when evaluating an investment project?
- How can PEIG attract long-term investment partners, make the project appealing to a broad range of investors, and address the challenges and implications of committing to a long-term, illiquid investment?

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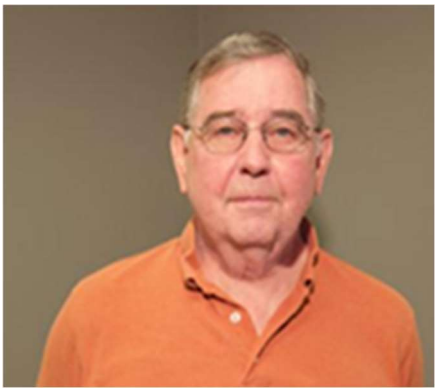

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