



Project Success Criteria in Social Infrastructure

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Abstract

The main aim of this paper is to conceptualize success for social infrastructure projects, examining juxtapositions between project management- and overall project success, as well as prevalent definitions for success in the public realm. The text includes a review of relevant literature on the topic of project success frameworks, in combination with a case study illustrating the differences between several success criteria on the example of the Indiana Toll Road project. The findings of the case study suggest that despite the project resulting in the bankruptcy of the private entity, it could nonetheless be considered a public project success, due to its large approval ratings by Indiana's citizens. Additionally, the study highlights the importance of safeguards against planning fallacy and optimism bias – issues which are amplified in social infrastructure procurement procedures. The topics discussed in this research paper concern qualifiers for success, in combination with a case study outlining the impact of improperly accounted for optimism bias. The obtained results may be of interest to representatives of science and practice, especially with regard to social infrastructure development.

Keywords: Social infrastructure, project success, project management success, optimism bias, public management

JEL classification: R11, R58, H83

1. Introduction

Whether a project may be coined a success is not always easy to assess – balancing factors such as opinions of the various stakeholders, as well as time, cost and quality constraints.

The subject becomes particularly complex in social infrastructure projects, in which a key success measure is that of the public's opinion. It is the aim of this article to showcase juxtapositions between different criteria of success in public infrastructure projects, on the example of an investment showcasing the difficulty of evaluating whether or not it was successful.

2. How can success be conceptualized

When determining the success of a project, the most commonly accepted definition outlines a timely and satisfactorily completed project which meets the stakeholders' expectations (Hai et al., 2022), or its compliance with time, cost and quality constraints (Ika, 2009).

De Wit (1988) however argued that in some cases, project management success and the overall success of a project may be at odds with each other – an observation particularly prevalent at lower managerial levels. Later research, including that by Baker et al. (2008) supported de Wit's claims, outlining that a satisfactory final result outweighed the success in upholding the project schedule or performance – also referred to as the so-called project management success. When aiming to qualify whether or not success has been accomplished, de Wit (1988) characterized three main measures:

1. The project's functionality:
 - Financial functionality,
 - Technical functionality,
 - Functionality derived otherwise.
2. The project management:
 - The budget,
 - The schedule,
 - Technical specifications.
3. The contractors' commercial performances:
 - Short term,
 - Long term.

2.1 Success criteria for public projects

With public sector projects, perceived success is frequently more important than real success due to politics playing a dominant role (De Wit, 1988; Baker et al., 2008). After all, democratic systems are based on election cycles, constituting a major motivator for public officials. With the satisfaction of the citizens thus hence a key measure of success, the absence of criticism may consequently be considered a marker of its accomplishment. Taking this into account, de Wit (1988) proposed a different set of assessment criteria for public projects, which are as follows:

1. A favorable environment,
2. Winning skill in bureaucratic politics through four strategies:
 - a. Differentiation,
 - b. Co-optation,
 - c. Moderation,
 - d. Managerial innovation.
3. An ability to manage technological development.

In summary, conceptualizing success in the realm of social infrastructure entails not only project completion within time and budget, but most prominently necessitates a satisfactorily completed result, as assessed by the public.

3. Accounting for project risks

Discussions surrounding project success inevitably lead to risk management, assessment and allocation – as without risk mitigation strategies, the likelihood of succeeding drastically deteriorates. The Project Management Institute (hereinafter: PMI) emphasizes an interesting distinction between individual- and overall project risk, arguing that individual risk may be understood as „(...) an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives” (Hillson, 2014). While, according to the PMI, risks may be both – positive or negative, negative risks are significantly more common and impactful for the overall success of a social infrastructure project, “[...] because there are many more things that can go wrong than go right, and because we are always trying to place emphasis on doing the job as quickly and cheaply as possible” (Vose, 2008, p. 474).

The second risk type outlined by the PMI is that of the overall project risk, i.e. „the effect of uncertainty on the project as a whole [constituting] more than the sum of individual risks within a project, since it includes all sources of project uncertainty [and] represents the exposure of stakeholders to the implications of variations in project outcome, both positive and negative” (Hillson, 2014). Said definition further underlines the importance of reducing uncertainty and accounting for all potential, project-related risks.

3.1 Optimism bias

The psychological tendency towards unrealistic optimism is frequently observable in social infrastructure projects, due to tendering procedures favoring the most „optimistic” offers with regard to budget, demand or completion time. Nonetheless, it is not always taken into account.

Kahneman and Tversky (1977) coined the term planning fallacy, describing it as the tendency to underestimate the time, cost and risk of future actions while at the same time also overestimating the benefits of said actions. This phenomenon often occurs regardless of an individual’s prior experience with tasks of a similar nature, and constitutes a contributing factor for the failure of many projects – including in the public realm.

According to Hackbarth (2008), managerial optimism produces a perception of lower default risks due to the higher perceived growth rate of earnings, which can make one overestimate the probability that favorable events will occur. Inaccurate forecasts of project costs, demand and other impacts constitute a major source of risk in project management (Flyvbjerg, 2006) and are significantly amplified in projects with overly optimistic management. According to models developed by Heaton (2002) and Malmendier et al. (2011), managerial characteristics and a bias toward optimism have an observable impact on corporate decisions. Managers tend to overestimate the return of investment or the profitability of success, while also thinking that the shares of their company are undervalued. Consequently, there is a managerial tendency to invest more than the optimal amount into risky projects. Said managerial risk tolerance is generally

mitigated by market forces – inaccurate risk taking quickly results in failure, making managers readjust their strategy. Said mitigation may however be delayed in social infrastructure projects, making them particularly susceptible.

In summary, the likelihood of a social infrastructure project's success can be significantly increased by focusing on the public's opinion prior to significant investments being made, as well as accounting for major risks which may appear in the planning-, construction and operation phase – in particular, optimism bias.

4. Case study of the Indiana Toll Road project

The Indiana Toll Road (hereinafter: ITR) project constituted an unusual adaptation of the public-private partnership formula, used to quickly generate public funding.

In 2005, after being newly elected, Republican Indiana Governor Mitch Daniels sought several billions of dollars to support „Major Moves” – a decades-long initiative aimed at enhancing and repairing the state's road infrastructure. His strategy involved inviting bids for the 252.7 kilometer Indiana East-West Toll Road, which links the Chicago Skyway to the Ohio Turnpike (Federal Highway Administration, 2022). The arrangement allowed for private partners to manage and operate the toll road, collecting tolls from drivers for 75 years, while the state retained ownership of the road (Poole, 2007). In exchange, Indiana would receive an up-front payment, with the lowest acceptable bid being set to two billion U.S. dollars. A crucial condition was that the private entity had to invest in lane widening projects, improve the state of the road's bridges and pavement, as well as invest in an electronic toll collection (hereinafter: ETC) system, marking a significant expenditure.

On the 29th of June 2006, the Indiana Toll Road Concession Company (hereinafter: ITRCC), a consortium between the Spanish construction company Cintra and the Australian toll road firm Macquarie Atlas Roads, was selected for the 75-year contract. The ITRCC won the contract primarily because of their substantial upfront payment of 3.8 billion U.S. dollars – a bid almost a billion dollars higher than their closest competitor (Wee & Hillion, 2013).

While surprising to many, the consortium justified their high bid primarily two-fold: Firstly, they argued that the toll road had a very high revenue potential constituting a crucial asset in their calculations. The ITR's toll rates were among the lowest in the country and had not been increased since 1985. Their planned toll increases, combined with projections of increased road traffic (based on the ITRCC's projected economic growth), led them to the belief of their investment offer being lucrative (Wee & Hillion, 2013). Secondly, they minimized expenditures by implementing a widely-used project finance mechanism known as an accreting swap – deferring higher debt service costs to later years, starting with lower payments initially. This method aimed to match debt payments with projected revenue growth, ensuring smoother early operations. The strategy included refinancing the debt before increased payments were due, relying on expected financial improvements and higher toll revenues in later years of operation (Puentes & Sabol, 2014; U.S. Federal Highway Administration, 2024).

4.1 The ITR – a project management success

It must be noted that despite the consortium's highly optimistic predictions, in the initial years the project could be considered successful – both from a project management, as well as from a public-perception perspective. The financial close of the project was achieved on June 29th 2006, as scheduled: The ITRCC, through a combination of bank loans and equity investments, forwarded Indiana the 3.8 billion USD upfront payment and the operation of the toll road was officially handed to the ITRCC. This marked the official start of the 75-year concession period, during which the consortium was responsible for the operation, maintenance and toll collection on the ITR. The implementation of the aforementioned conditions specified by the state (the ETC system, repairs and lane widening) were implemented in record time: the ETC shortly after transition to the private entity, and works on the mandatory road improvements and extensions beginning in July of 2006. A crucial element with regard to ensuring a smooth transition was the high retention rate of former state employees: As noted by Wee and Hillion (2013), by February 2007, the consortium had interviewed all state employees and made offers, with about 80% of the former state employees having been hired directly by the ITRCC. The high retention rate in turn not only helped operations, but positively impacted the public's perception of the project (Gilroy & Aloyts, 2013).

Initially, there were hesitations about the project – as noted by Indiana Senator Vi Simpson: „If a foreign company can use the Toll Road to issue bonds to make a 13 percent profit off the taxpayers and motorists of Indiana, then why can't the State of Indiana keep this asset and do the same thing?“ (Wilkerson, 2006). Over time however, as the ITRCC demonstrated effective management and operation of the toll road, public perception began to improve. As outlined by Wee and Hillion (2013), the consortium improved the public's opinion of the project through a number of initiatives, namely: 1.) ensuring minimal service disruptions; 2.) maintaining good media/public relations; and 3.) undertaking Independent branding as to create a positive, community-focused image for the ITR.

The aforementioned initiatives were aided by a state-funded „toll freeze“ agreement with the ITRCC: To address concerns over sharp near-term toll increases, the consortium agreed to a „toll freeze“ for light vehicles for the first ten years. This agreement allowed the state to use a portion of the proceeds from the 3.8 billion USD transaction to subsidize the toll rates for passenger vehicles, costing Indiana taxpayers 150 million USD over ten years in reimbursements to the consortium (Wee & Hillion, 2013).

To summarize, the initial years of operation showcased good management on behalf of the private partner, while the public's opinion was generally favorable with regard to the project. As previously noted, for public projects, satisfaction of the citizens constitutes a key measure of success – the absence of criticism hence consequently showcasing a marker of its accomplishment (de Wit, 1988). There was no major public criticism about the ITR, with a 2012 opinion survey finding that 76% of the toll road's customers possessed a favorable impression of the highway (Poole, 2014).

4.2 Economic crisis and bankruptcy

Though initially successful, the onset of the Great Recession significantly impacted traffic volumes, most notably commercial vehicle traffic. Said development was particularly problematic due to approximately 60% of the collected tolls being paid by trucks (Arshad, 2010). As ITRCC's financial model was predicated on optimistic projections, the decline in traffic volumes resulted in significant revenue shortfalls, making it difficult for the company to meet its debt service obligations (Miller, 2014).

The aggressive financial structure, including the use of the previously outlined accruing swap, resulted in high debt service payments. With revenue projections falling short, the company struggled to cover these increasing payments. Said development was worsened with the downgrading of the ITRCC's debt by credit rating agencies due to the ongoing financial difficulties – in turn, increasing the cost of borrowing and further limiting financial flexibility. At this point, it became evident that optimism bias played a crucial role in the ITRCC's initial calculations and decision behind the 3.8 billion dollar bid. As noted by Governor Mitch Daniels in 2011: „The reason they're having trouble paying their bills is because they made an unbelievably high bid... This was an unbelievably good deal for Indiana” (Wee & Hillion, 2013, p. 16). The Governor was not wrong: As noted by Poole in 2014, „since taking over in 2006, ITRCC has invested \$458 million in the toll road, adding new lanes, rehabilitating bridges and pavement, and implementing a new electronic tolling system.”

While favorable for the public, ITRCC filed for Chapter 11 bankruptcy in 2014 due to failing to meet a 102 million U.S. dollar interest payment. With the bankruptcy court approving a plan to auction the lease, in May of 2015, IFM Investors completed the acquisition of the Indiana Toll Road Concession Company for 5.7 billion U.S. dollars, thereby acquiring the right to collect tolls for the remaining 66 years of operations, ensuring operational continuity for users (IFM Investors, 2015). Most notably, the bankruptcy in no way negatively impacted the state of Indiana: The bankruptcy proceedings did not entail a bailout, and the state kept both the initial payment, as well as the investments made by the ITRCC, increasing the road's value – showcasing the ITRCC's „sunk costs”, or expenses that have already been incurred and cannot be recovered (Arkes & Blumer, 1985).

4.3 The ITR: Success or failure

The Indiana Toll Road project illustrates a very peculiar case with regard to the widely accepted project success framework. On the one hand, it ended with the private partner filing for bankruptcy and the project being auctioned to a different private entity. Thus, from the perspective of the ITRCC, the project certainly constitutes a failure, being the result of optimism bias in the initial calculations.

Another perspective from which the project could be regarded as a failure concerns that of the development of the local public-private partnership market: One could argue that the contractual agreement ending in the private entity's bankruptcy may disincentivize companies to engage in future PPP procedures. Said concern seems to however not have materialized in the case of the state of Indiana, taking into account the successful auction of the remainder of the ITR lease agreement.

Regarding project management success, answering the question however becomes less clear. One very large failure can be attributed to improper safeguards against optimism bias on behalf of the private entity, leading to overly optimistic demand and revenue forecasts. Other than said major error however, one could argue that the project was properly managed: Initially, all objectives were met within time and budget, and the transition from public to private operation went smoothly, thanks to a large percentage of employee retention. That, in combination with a good PR strategy chosen by the ITRCC, showcases good managerial practice.

With regard to the success framework for public projects outlined by de Wit in 1988, the project may however be coined an overarching success – despite the consortium’s bankruptcy filing. De Wit’s framework outlined for public project success to be primarily assessed on the basis of public opinion. It is clear that the majority of citizens of Indiana approved of the project, even after the private partner’s bankruptcy started to become probable (Poole, 2014; Wee & Hillion, 2013). This is most likely due to the perception of Indiana having gotten a „good deal”, as voiced by Governor Daniels: The state received (and invested) the 3.8 billion dollars, in addition to retaining the ITRCC’s „sunken costs” in the form of hundreds of millions of dollars spent on road infrastructure investments- and repairs.

5. Conclusions

As exemplified by the Indiana Toll Road project, categorizing a social infrastructure project as either „success” or „failure” is not always as clear-cut as it may initially appear: Despite leading the private partner to inevitable bankruptcy, the ITR project had the approval of a large majority of Indiana’s citizens. While the project is exceptional with regard to its structure and outcome, it highlights insights relevant for assessing social infrastructure projects.

Firstly, success – in public projects – truly lies in the „eye of the beholder”, i.e. the public. It is hence of essence to ensure for an initiative to possess the citizens’ approval prior to any major investments being made. The ITR project met those criteria, even prior to bankruptcy, which certainly was helped by the government implementing the toll-freeze measures, as well as PR initiatives enacted by the ITRCC.

Secondly, optimism bias constitutes one of the main hindrances to success in social infrastructure projects. This is primarily caused by how bidding- or procurement procedures are usually structured, i.e. the contract generally being awarded to the most optimistic „bidder”. While, in academic literature, this phenomenon has been studied for decades, proper cost- and demand forecasting, as well as safeguards against optimism bias, are to this day frequently lacking in social infrastructure procurement procedures. In the case of the ITR this resulted in favorable outcomes for the state, due to the upfront payment and unusual structure of the agreement. Usually however, it is the public who loses out on issues related to optimism bias and planning fallacy. Implementing preventative safeguards is thus of essence.

Lastly, we wish to emphasize that, while being potentially perceived as a „public project success”, situations such as those of the ITRCC’s bankruptcy should be strived to be avoided – despite the state of Indiana’s profits from the partnership. The bankruptcy of



large private entities leads to inevitable negative outcomes for the public – be it lost jobs, public revenue and other negative impacts resulting from the loss of economic activity.

References

- Arkes, H. R. and Blumer, C. (1985) "The psychology of sunk cost," *Organizational Behavior and Human Decision Processes*, 35(1), pp. 124-140. DOI: 10.1016/0749-5978(85)90049-4.
- Arshad, F. (2010) "Valuation of the Indiana Toll Road and Chicago Skyway Privatizations," *University of Manchester*. Available at: <https://core.ac.uk/reader/4422220> (Accessed: April 14th, 2024).
- Baker, B.N., Murphy, D.C. and Fisher, D. (2008) "Factors Affecting Project Success," *Project Management Handbook*. DOI: 10.1002/9780470172353.ch35.
- de Wit, A. (1988) "Measurement of project success," *International Journal of Project Management*. DOI: 10.1016/0263-7863(88)90043-9.
- Federal Highway Administration. (2022) "Infrastructure Case Study: Indiana Toll Road," *U.S. Department of Transportation*. Available at: https://www.fhwa.dot.gov/ipd/value_capture/case_studies/indiana_toll_road.aspx (Accessed: April 14th, 2024).
- Federal Highway Administration. (2024) "Project Profiles: Indiana Toll Road.," *U.S. Department of Transportation*. Available at: https://www.fhwa.dot.gov/ipd/project_profiles/in_indiana_toll.aspx (Accessed: April 14th, 2024).
- Federal Highway Administration. (2024) "Project Profiles: Indiana Toll Road," *U.S. Department of Transportation*. Available at: https://www.fhwa.dot.gov/ipd/project_profiles/in_indiana_toll.aspx (Accessed: April 14th, 2024).
- Flyvbjerg, B. (2006) "From Nobel Prize to Project Management: Getting Risks Right," *Project Management Journal*. DOI: 10.1177/875697280603700302
- Flyvbjerg, B. (2007) "Policy and planning for large-infrastructure projects: Problems, causes, cures," *Environment and Planning B: Planning and Design*. DOI: 10.1068/b32111
- Gilroy, L. and Aloyts, D. (2013) "Leasing the Indiana Toll Road: Reviewing the First Six Years Under Private Operation," *Reason Foundation*. Available at: https://reason.org/wp-content/uploads/files/indiana_toll_road_lease.pdf (Accessed: April 14th, 2024).



- Hackbarth, D. (2008) "Managerial Traits and Capital Structure Decisions," *Journal of Financial and Quantitative Analysis*, 43(4), pp. 843-881. DOI: 10.1017/S002210900001437X.
- Hai, D.T., Toan, N.Q. and Van Tam, N. (2022) "Critical success factors for implementing PPP infrastructure projects in developing countries: the case of Vietnam," *Innovative Infrastructure Solutions*. DOI: 10.1007/s41062-021-00688-6.
- Heaton, J.B. (2002) "Managerial Optimism and Corporate Finance," *Financial Management*. Available at: <https://ssrn.com/abstract=304622> (Accessed: April 14th, 2024).
- Hillson, D. (2014) "How risky is your project – and what are you doing about it?," *PMI Global Congress Proceedings*. Available at: <https://www.pmi.org/learning/library/risky-project-doing-it-9351> (Accessed: April 14th, 2024).
- IFM Investors. (2015) "IFM Investors completes acquisition of Indiana Toll Road Concession Company". Available at: <https://www.ifminvestors.com/news-and-insights/media-centre/ifm-investors-completes-acquisition-of-indiana-toll-road-concession-company/> (Accessed: April 14th, 2024).
- Ika, L.A. (2009) "Project Success as a Topic in Project Management Journals," *Project Management Journal*, pp. 6-19. DOI: 10.1002/pmj.20137.
- Kahneman, D. and Tversky, A. (1977) "Intuitive prediction: Biases and corrective procedures. Decision Research Technical Report," *Judgment Under Uncertainty: Heuristics and Biases. Science*, pp. 414-421. DOI: 10.1017/CBO9780511809477.031.
- Malmendier, U., Tate, G. and Yan, J. (2011) "American Finance Association Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies," *The Journal of Finance*. DOI: 10.2307/41305173.
- Miller, E. (2014) "Indiana Toll Road Seeks Bankruptcy as Traffic Declines," *Transport Topics*. Available at: <https://www.ttnews.com/articles/indiana-toll-road-seeks-bankruptcy-traffic-declines> (Accessed: April 14th, 2024).
- Poole, R. (2007) "The Indiana Toll Road: One Year Later," *Reason Foundation*. Available at: <https://reason.org/commentary/the-indiana-toll-road-one-year/> (Accessed: April 14th, 2024).
- Poole, R. (2014) "What the Indiana Toll Road Bankruptcy Means for Indiana, Other States, and Future Public-Private Partnerships," *Reason Foundation*. Available at: <https://reason.org/commentary/indiana-toll-road-bankruptcy/> (Accessed: April 14th, 2024).



- Puentes, R. and Sabol, P. (2014) "The Indiana Toll Road: How did a good deal go bad?," *Brookings Institution*. Available at: <https://www.brookings.edu/articles/the-indiana-toll-road-how-did-a-good-deal-go-bad/> (Accessed: April 14th, 2024).
- Vose, D. (2008) "Risk Analysis: A Quantitative Guide," (3rd ed.), *Wiley*. ISBN: 9780470512845.
- Wee, J. and Hillion, P. (2013) "Public-Private Partnerships: The Project Financing of the Indiana Toll Road," *INSEAD*. Available at: <https://www.thecasecentre.org/products/view?id=108613> (Accessed: April 14th, 2024).
- Wilkerson, D. (2006) "A detour for Major Moves," *NUVO*. Available at: https://www.nuvo.net/news/news/a-detour-for-major-moves/article_f59969b8-437c-5694-8414-d189e9e36188.html (Accessed: April 14th, 2024).