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Funds Management and Performance of Infrastructural Projects in Canada: A Case Study of Trans-Canada Highway

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Abstract

Funds management is a crucial aspect of infrastructure projects, ensuring that financial resources are effectively allocated and utilized to achieve project goals. It involves the strategic planning, budgeting, and monitoring of funds throughout the project lifecycle. The performance of infrastructural projects is measured through various indicators, including cost management, schedule adherence, quality of deliverables, and overall project outcomes. Effective funds management plays a significant role in project performance, as it helps ensure that funds are allocated optimally and used efficiently. Infrastructure projects often require substantial investments, and funds management helps mitigate financial risks by monitoring expenditures, identifying cost overruns or budget deviations, and implementing corrective measures. It also involves financial forecasting and risk assessment to anticipate and address potential challenges or constraints that may impact project performance. The study used the descriptive research design. The target population was 35 members of Transport Canada. The study did sampling of 25 respondents that were selected from the target population of 35 members of Transport Canada. The collection of data was conducted through stratified random sampling whereby questionnaires were used to gather data. The study concluded that the challenges surrounding funds management, cost control, performance evaluation, environmental considerations, and stakeholder collaboration must be addressed to ensure the optimal utilization of resources and the long-term sustainability of the project. Securing stable and adequate funding sources from national and provincial governments is crucial for the Trans-Canada Highway's continued development and maintenance. The study recommended that both national and provincial governments should establish a long-term funding plan that spans the entire lifecycle of the project. Regular assessments and data collection should be conducted to identify bottlenecks, areas for improvement, and emerging needs.

Keywords: *Funds Management, Performance, Infrastructural Projects, Canada*

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1.0 Background of the Study

The Trans-Canada Highway is a significant infrastructural project in Canada, spanning across the country and connecting all ten provinces (Rodrigue, 2021). The management of funds for such large-scale projects is crucial to ensure their successful completion and ongoing maintenance. The Trans-Canada Highway project has relied on a combination of federal and provincial government funding. Both levels of government allocate funds for the construction, maintenance, and improvement of the highway. The government contributes to the project through its infrastructure funding programs, while provinces provide their share of funding based on the sections of the highway within their jurisdictions (Sinha & Jha, 2020). In some cases, public-private partnerships have been established to fund and deliver specific sections of the Trans-Canada Highway. These partnerships involve private sector entities investing in the project in exchange for tolling rights or other revenue streams. PPPs can help leverage private capital, expertise, and innovation to expedite project completion.

According to Munzur (2022), the funds allocated to the Trans-Canada Highway project are utilized for various purposes, including land acquisition, construction, maintenance, and safety improvements. Budgets are established based on project requirements, timelines, and anticipated costs, ensuring that sufficient funds are available for each phase of the project. Cost management is a critical aspect of infrastructural projects. For the Trans-Canada Highway, cost estimates are prepared, and project managers closely monitor expenses throughout the construction and maintenance phases. Regular cost assessments help identify any budgetary deviations and implement corrective measures to ensure funds are used efficiently (Blay, 2020). The performance of the Trans-Canada Highway is assessed through various metrics, including travel time, road condition, safety records, and user satisfaction. Regular evaluations and feedback from users allow authorities to identify areas for improvement and allocate funds accordingly.

The Trans-Canada Highway requires ongoing maintenance to ensure its safety and usability (Wang & Wang, 2022). Funds are allocated for activities such as pavement repairs, snow removal, signage upgrades, and bridge maintenance. Regular maintenance programs are implemented to extend the lifespan of the infrastructure and minimize disruptions. A portion of the funds is dedicated to safety enhancements, such as the installation of barriers, improved signage, lighting upgrades, and traffic management systems. These investments aim to reduce accidents, enhance driver experience, and improve overall road safety. Funds are also allocated to incorporate advanced technologies into the Trans-Canada Highway infrastructure (Bisson & Stevens, 2020). This may include intelligent transportation systems, real-time traffic monitoring, electronic tolling systems, and integration with smart city initiatives. Technological advancements improve the efficiency and effectiveness of the highway network. As with any large-scale project, funds are allocated to address environmental concerns. This may involve implementing measures to mitigate ecological impacts, promoting sustainable construction practices, and incorporating eco-friendly features into the infrastructure (Fenn, Nanji, Rolfe & Sussman, 2019).

The Trans-Canada Highway plays a significant role in supporting economic growth and development across the country. Seydewitz, Mulrennan and García (2022) mentioned that efficient transportation networks facilitate trade, commerce, and tourism, generating economic benefits for

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various industries and communities along the highway's route. Effective funds management for the Trans-Canada Highway involves collaboration between multiple stakeholders, including federal and provincial governments, local authorities, private sector partners, and community representatives. Coordination among these entities ensures optimal allocation of funds and successful project execution. The funds management and performance of the Trans-Canada Highway are subject to continuous improvement (Guha, 2021). Lessons learned from previous projects, feedback from users, and advancements in technology and construction practices inform ongoing refinements in funding strategies and project management approaches.

1.1 Statement of the Problem

The Trans-Canada Highway is a critical infrastructural project in Canada, connecting all ten provinces and facilitating transportation and trade across the country. However, effective funds management and performance evaluation are essential aspects of the project's success. Several challenges and issues surround the funds management and performance of the Trans-Canada Highway, which need to be addressed to ensure optimal utilization of resources and long-term sustainability. There is a concern regarding the availability and allocation of funds for the Trans-Canada Highway. As a massive undertaking, the project requires significant financial resources for its construction, maintenance, and improvement. Ensuring a stable and adequate funding source is crucial to avoid delays, disruptions, and compromised quality of the infrastructure. The challenge lies in securing long-term funding commitments from federal and provincial governments to meet the ongoing requirements of the project. The cost management of the Trans-Canada Highway is a complex task. With such a vast network spanning diverse terrains and climates, managing construction costs, ongoing maintenance expenses, and safety enhancements can be challenging. Accurate cost estimation, continuous monitoring, and effective cost control mechanisms are necessary to prevent cost overruns and ensure the efficient use of funds.

Evaluating the performance of the Trans-Canada Highway requires a comprehensive approach. Performance metrics such as travel time, road condition, safety records, and user satisfaction need to be consistently measured and assessed. The challenge lies in implementing a robust performance evaluation system that captures all relevant indicators, involves stakeholder input, and provides actionable insights for continuous improvement. Environmental considerations pose a significant challenge for the Trans-Canada Highway. As a large-scale infrastructure project, it can have ecological impacts on the surrounding environment. Allocating funds for sustainable construction practices, environmental mitigation measures, and incorporating eco-friendly features into the infrastructure is crucial. Striking a balance between economic development and environmental sustainability is a key challenge in managing funds and ensuring the project's long-term viability. Stakeholder collaboration and coordination play a vital role in funds management and performance of the Trans-Canada Highway. Involving federal and provincial governments, local authorities, private sector partners, and community representatives in decision-making processes is essential. The challenge lies in effectively coordinating and aligning the interests and priorities of various stakeholders to ensure optimal funds allocation and seamless project execution.

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2.0 Literature Review

Vrchota, Řehoř, Maříková and Pech (2020) conducted study to measure how fund management contribute to successful project completion in Bulgaria. There were four main goals: to examine how budgeting affects project success in Bulgaria, how much of a role fundraising plays in that success, how much of an impact resource allocation has on success, and how much of an impact financial control has on success. This study combined qualitative and quantitative methods for a descriptive-correlational analysis. Seventy-one workers made up the sample size for this research. In this investigation, questionnaires served as the primary method of information gathering. Frequencies and percentages of respondents were calculated using descriptive statistics, and relationships between the various variables were determined using regression analysis and the Pearson correlation coefficient. In this analysis, we utilized SPSS version 16. The study found a positive correlation between project success in Bulgaria and four different financial management practices: allocating funds, controlling funds, creating a budget, and raising money. Projects' success (Y) = $-0.364 + 0.218 * \text{budgeting} + 0.595 * \text{fundraising} + 0.256 * \text{funds allocation} + 0.653 * \text{funds control}$, according to the study's regression analysis. This means that when project management gives way to operational management, budgeting, fundraising, allocating, and controlling finances will become increasingly central. The conversation has led us to the conclusion that budgeting, fundraising, control, and allocation of cash all have significant effects on the success of the project. The budgeting process and the methods employed to create it are meant to guarantee efficient use of money. It is the responsibility of the project management team to ensure that all aspects of the project's budget, control, allocation, and fundraising are transparent and in line with the best practices of project management at all times.

AlGeelani, Dabous and Venkatachalam (2020) conducted research to explore the effects of various financing activities on the finalization of government sponsored building projects in Fujairah, UAE. The theory of goal-setting provides the theoretical framework for this investigation. The method used in this study was a descriptive survey. The study's sample size was 350 out of a total of 650 participants, including 650 government administrators and project managers responsible for the Bus Park, stadium, and hospital development, and 650 project beneficiaries. Managers in the field of housing and urban development filled out a semi-structured, self-administered questionnaire for this research. Both quantitative and qualitative techniques were used to examine the information gathered. Descriptive and inferential statistics were at the heart of the quantitative approach. Quantitative data was presented in the form of tables using descriptive statistics like frequencies and percentages. SPSS Ver. 20 was used to enter and code the questionnaire data. The qualitative data was analyzed for content and then presented in narrative form. The correlation between the variables was determined by applying a simple linear regression model to the quantitative data. Study results based on funding activities objective showed that 78.66% (mean=5.36, Std. Dev=0.789) of respondents accepted funding for the construction projects are delayed due to most of the county budgetary allocated money being delayed from the national government, poor resource management by the managers in charge, prioritizing salaries paid to workers and failing to give similar weight to the construction of projects, and some contractors may lack e.g. The research found that subpar financing strategies lengthened the time it took to finish building projects. When there is a lull in the flow of finances into a project, progress on the

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ground slows to a crawl, and the project may never be finished. Legislators are urged by the report to approve legislation seen as beneficial to the nation's progress. The time it takes to finish a project should be monitored to maximize productivity.

Ribeiro (2020) conducted study to look at how factors like budgetary constraints and financial management training affected the success of state government initiatives in Carabobo. The study employed a descriptive research strategy. Research obstacles included: Officials in Carabobo State were hesitant to grant permission for the study to be conducted in their departments because of the high cost of travel to all of the projects' remote locations and the heavy workload of the respondents on the day of the visit. The sample size was calculated to be 354 finance managers from all Carabobo State development projects for the fiscal year 2018/2019. Ninety participants were selected at random from the population of interest. Questionnaires were used to compile the data, and they were made to ensure that respondents provided honest answers. Both qualitative and quantitative methods were used to examine the data. Pearson's correlation coefficient and multiple regressions were used to analyze the data and draw conclusions about the connection between the variables. The research found that there was a statistically significant relationship between the total financial considerations and the success of government initiatives in Carabobo State. There was a statistically significant correlation between the success of government initiatives in Carabobo State and factors like access to finance, budgetary control, and training in financial management. The research revealed that the success of Carabobo state government initiatives was significantly influenced by financial variables such as access to funds, budgetary control, and training in financial management. To improve the performance of projects being implemented by the county government, it was suggested that Carabobo State's leadership increase funding for projects, implement stronger budgetary controls, and provide adequate training for finance managers.

Bruns-Berentelg, Noring and Grydehøj (2022) performed research to determine the impact of financial management strategies on the success of a construction project in Hamburg, Germany. Planning theory served as a conceptual framework for the research. A total of 87 top-level Hamburg workers from 21 different projects were randomly selected using stratified and simple random selection methods. Structured questionnaires were used to gather the data. The dependability of the data collecting tools was evaluated using a test-retest procedure, and it was found to be above $\text{Alpha}=0.8$. The study used an after-the-fact research strategy. The information was analyzed using both descriptive and inferential statistics. The hypotheses were tested using regression analysis with a p value of 0.05. The results showed that planning and financial reporting boosted project success. The findings of this research highlight the importance of proficient budgeting skills and the necessity for improved education for project managers regarding interest rate computation. Employees should also be able to report and analyze data effectively.

Grakhov, Mohnachev, Simakova, Kislyakova, Saidova and Armyanin (2020) conducted study to investigate the impact of budget management on project success in Russia, the Moscow-Kazan High-Speed Railway project served as a case study. Focusing on the Moscow-Kazan High-Speed Railway project in particular, this research aimed to determine the impact of fund allocation management, budget execution management, and variance determination on project success. Top Management Support capability and technology elements both influenced the outcomes of the study's variables. Agency theory, utility theory, and uncertainty theory served as theoretical

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foundations for the current investigation. The researcher used a descriptive study approach, which enabled them to take into account a wide range of factors related to budget management and their impact on performance. These fundamental characteristics, in tandem with the descriptive research survey methodology, allowed for a comprehensive exploration of all issues related to the management of costs and the effectiveness of the Moscow–Kazan High-Speed Railway in Russia. Using the Yamane method, a random sample of 43 participants was selected from a population of 50 Project staff members having direct involvement in the project. Project employed a stratified random sampling probability method to choose its samples. The questionnaires used in the research were designed with mostly closed ended items to facilitate analysis. After collecting data, the researcher used SPSS Version 23 to analyze descriptive statistics, including measures of central tendency (mean, mode, and median) and measures of dispersion (standard deviation, variance). All of the individual factors were found to have statistical significance, as shown by the results of the research. Financial staff working on the Moscow-Kazan High-Speed Railway project should, according to the findings, take great care to identify the risks that may arise throughout the project's life cycle (from inception to operation) and allocate those risks to the participants who are best able to manage them along the lines of fund, budget, and variance management.

3.0 Research Methodology

The study used the descriptive research design. The target population was 35 members of Transport Canada. The study did sampling of 25 respondents that were selected from the target population of 35 members of Transport Canada. The collection of data was conducted through stratified random sampling whereby questionnaires were used to gather data.

4.0 Research Findings and Discussion

4.1 Correlation Analysis

The findings presented in Table 1 shows the correlation analysis

Table 1: Correlation Analysis

		Performance	Funds Management
Performance	Pearson Correlation	1.000	
	Sig. (2-tailed)		
Funds Management	Pearson Correlation	.264 **	
	Sig. (2-tailed)	0.000	0.000

The correlation results from Table 1 show that the funds management was positively and significantly associated with performance ($r=.264$, $p=.000$). This concurs with Vrchota, Řehoř, Maříková and Pech (2020) who argued that budgeting, fundraising, control, and allocation of cash all have significant effects on the success of the project. Effective allocation and utilization of funds contribute to the timely completion, quality execution, and long-term sustainability of

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infrastructure initiatives, positively impacting the overall development and economic growth of the country.

4.2 Regression Analysis

The section includes model fitness, analysis of variance and regression of coefficient. The results in Table 2 indicate the model fitness

Table 2: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.264a	0.214	0.111	0.0074352

The results from Table 2 reveal that funds management was found to be satisfactory in explaining the performance of infrastructural projects in Canada. This was supported by the coefficient of determination, which is R square of 0.214. It shows that funds management explain 21.4% of the variations in the performance of infrastructural projects in Canada. Funds management plays a critical role in the performance of infrastructural projects like the Trans-Canada Highway in Canada, ensuring that sufficient financial resources are allocated for its construction, maintenance, and upgrades.

Table 3: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.89	1	5.89	25.83	.000b
	Residual	7.99	35	0.228		
	Total	13.88	34			

The findings in Table 3 shows that the overall model was statistically significant. The results reveals that performance is a good predictor in explaining the funds management among the infrastructural projects in Canada. This was supported by an F statistic of 25.83 and the reported p-value of 0.000 which was less than the conventional probability significance level of 0.05.

Table 4: Regression of Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.361	0.086		4.198	0.051
Funds Management	0.591	0.201	0.582	2.940	0.003

Based on the results in Table 4, it was found that funds management was positively and significantly associated to performance ($\beta=0.591$, $p=0.003$). This was supported by a calculated t-statistic of 2.940 that is larger than the critical t-statistic of 1.96. These results implies that when funds management increases by one unit, the performance of infrastructural projects in Canada will increase by 0.591 units while other factors that influence the performance in primary schools remain unchanged. Ribeiro (2020) mentioned that there was a statistically significant correlation between the success of infrastructural projects and factors like access to finance, budgetary control, and training in financial management. The success of infrastructural projects was significantly influenced by financial variables such as access to funds, budgetary control, and training in financial management. To improve the performance of projects being implemented, it was suggested that government should increase funding for projects, implement stronger budgetary controls, and provide adequate training for finance managers. Proper funds management allows for timely and efficient project execution, enabling the Trans-Canada Highway to serve as a vital transportation artery, connecting provinces and contributing to economic development, trade, and connectivity across the country.

5.0 Conclusion

Efficient funds management and performance evaluation are critical components for the success of infrastructural projects, such as the Trans-Canada Highway in Canada. The challenges surrounding funds management, cost control, performance evaluation, environmental considerations, and stakeholder collaboration should be addressed to ensure the optimal utilization of resources and the long-term sustainability of the project. Securing stable and adequate funding sources from national and provincial governments is crucial for the Trans-Canada Highway's continued development and maintenance. This requires long-term commitments to avoid delays and compromises in infrastructure quality. Moreover, effective cost management mechanisms must be implemented to prevent cost overruns and ensure the efficient use of funds. A comprehensive performance evaluation system that captures key metrics such as travel time, road condition, safety, and user satisfaction is essential. This allows for continuous monitoring and assessment of the highway's performance, leading to actionable insights for improvement. Additionally, environmental considerations should be integrated into the project through sustainable construction practices and mitigation measures to balance economic development with environmental sustainability. Successful funds management and performance evaluation also

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require strong stakeholder collaboration and coordination. Involving national and provincial governments, local authorities, private sector partners, and community representatives in decision-making processes ensures alignment of interests and priorities. Effective collaboration enhances funds allocation, project execution, and long-term project viability.

6.0 Recommendations

It is recommended to establish a long-term funding plan that spans the entire lifecycle of the project. This plan should involve commitments from both national and provincial governments to provide consistent funding for construction, maintenance, and improvement of the highway. Clear guidelines and mechanisms should be put in place to address funding gaps and fluctuations in budgets, ensuring uninterrupted progress and quality infrastructure. Adopting advanced project management practices can greatly enhance funds management and performance of the Trans-Canada Highway. This includes the use of sophisticated cost estimation techniques, rigorous cost control measures, and regular financial audits. Implementing robust project management software and tools can enable better monitoring of expenses, resource allocation, and timely financial reporting. Additionally, incorporating risk management practices into the project can help identify potential budgetary and performance risks early on, allowing for proactive mitigation strategies.

Leveraging public-private partnerships (PPPs) can offer additional funding sources, expertise, and innovation for the Trans-Canada Highway. Encouraging private sector participation through PPP models allows for the sharing of risks and costs while capitalizing on private sector efficiency and expertise. Governments should create an enabling environment for PPPs by streamlining regulatory frameworks, providing clear guidelines, and establishing transparent procurement processes. This can attract private investment and accelerate the project's implementation, ultimately benefiting both the public and private sectors. Continuous performance monitoring and evaluation are essential for the Trans-Canada Highway's success. It is recommended to develop comprehensive performance indicators that capture various aspects, including travel time, road condition, safety records, and user satisfaction. Regular assessments and data collection should be conducted to identify bottlenecks, areas for improvement, and emerging needs. Stakeholder feedback and engagement should be actively sought to ensure that performance evaluation aligns with the expectations and requirements of the highway's users and surrounding communities.

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