



## Assessment of Hybrid Work Arrangements as a Fuel Consumption Reduction Strategy for DPWH Field Personnel Amid Rising Fuel Prices

MARY MARGARETHE C. PAJARILLAGA, RCE<sup>1</sup>, MICHAEL JOHN M. VILLAR, PH.D.<sup>2</sup>, MARIA CRISTINA D. FERRER PH.D.<sup>3</sup>

<sup>1</sup> Student, Graduate School, Master of Engineering Management, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

<sup>2,3</sup> Professor, Graduate School, Master of Engineering Management, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

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**ABSTRACT:** The increasing volatility of global fuel prices has posed significant challenges to fuel-dependent economies such as the Philippines. This study assesses hybrid work arrangements as a strategy for reducing fuel consumption among Department of Public Works and Highways Nueva Ecija 1<sup>st</sup> District Engineering Office (DPWH-NE1st DEO) field personnel. A quantitative descriptive-correlational design was employed, utilizing a structured questionnaire administered to 50 respondents. The study examined travel frequency, fuel consumption, productivity, and perceptions of hybrid work implementation. Findings indicate that the implementation of a hybrid work arrangement can reduce weekly fuel consumption by approximately 37–38%, equivalent to an average savings of about 9–10 liters per week from the typical 20–30 L baseline. However, physical site inspections remain essential. The study concludes that hybrid work is a viable and effective strategy for improving efficiency and reducing fuel consumption.

**KEYWORDS:** Fuel consumption, hybrid work, public sector, DPWH, work flexibility

### I. INTRODUCTION

The sustained increase in global fuel prices has become a critical concern for economies dependent on imported energy. Geopolitical conflicts have contributed to price volatility, affecting transportation costs and government operations. The Department of Public Works and Highways Nueva

Ecija 1<sup>st</sup> District Engineering Office (DPWH-NE1st DEO), being a field-intensive agency, requires frequent travel for site inspections. Hybrid work arrangements offer a potential solution by reducing unnecessary travel while maintaining productivity.

### II. REVIEW OF RELATED LITERATURE

Global fuel price volatility, largely influenced by geopolitical conflicts such as the Russia-Ukraine crisis, has significantly affected oil supply chains and increased fuel costs worldwide. For fuel-importing countries like the Philippines, these fluctuations result in higher transportation and operational expenses, particularly in government agencies that rely heavily on mobility.

Work-related travel has been identified as a major contributor to fuel consumption, especially in field-intensive sector like infrastructure development. Studies emphasize that reducing travel demand is an effective strategy for minimizing fuel use and improving efficiency.

Hybrid work arrangements, which combine remote and on-site work, have gained attention as a practical solution to reduce commuting and travel-related energy consumption. Research shows that tasks such as documentation, reporting, and coordination can be effectively performed remotely, leading to reduced fuel usage and improved productivity. However, in engineering contexts, physical site inspections remain essential, limiting the full adoption of remote work.

The study is anchored to Travel Demand Management Theory, which promotes reducing unnecessary travel, the Technology Acceptance Model, which explains the adoption of digital tools, and Work Flexibility Theory, which supports adaptive work arrangements. These frameworks



support the potential hybrid work as strategy for reducing fuel consumption while maintaining operational efficiency.

### **III. RESEARCH METHODOLOGY**

#### *Research Design*

The study employed a quantitative descriptive correlational research design to assess the effectiveness of hybrid work arrangements in reducing fuel consumption. The descriptive aspect was used to analyze work practices and fuel usage, while the correlational aspect examined the relationship between hybrid work adoption and fuel consumption.

#### *Research Locale*

This study was conducted in Department of Public Works and Highways Nueva Ecija 1<sup>st</sup> District Engineering Office in the Philippines, focusing on field personnel engaged in both on-site and administrative tasks.

#### *Population and Sampling*

The respondents consisted of DPWH-NE1st DEO field personnel involved in project implementation. A purposive sampling technique was used to select 50 respondents who have experience with both fieldwork and hybrid work arrangements.

#### *Research Instrument*

Data were collected using a structured questionnaire consisting of demographic information, work practices, fuel consumption and perceptions of hybrid work. A 5-point Likert scale was used to measure responses, ranging from strongly disagree to strongly agree.

### **IV. RESULT AND DISCUSSION**

The finding indicate that DPWH-NE1st DEO field personnel frequently conduct site visits, typically three to five times per week, resulting in fuel consumption ranging from 20 to more than 30 liters per week. Site visits and traveling were identified as the most time-consuming task.

Survey results indicate that field personnel consume an average of 26.2 liters of fuel per week, which falls within the typical 20–30 L/week baseline. The average number of site visits is approximately 2.4 times per week. Under a proposed hybrid work arrangement, where site visits are reduced to an estimated 1–2 times per week, fuel consumption is projected to decrease proportionally. This results in an estimated weekly fuel use of 16.4

liters, equivalent to a reduction of approximately 9–10 liters per week.

Respondents generally agreed that hybrid work arrangements improve productivity, particularly for documentation and administrative tasks. Remote work was found to reduce interruptions and support effective time management. Despite these benefits, respondents strongly emphasized that physical site visits remain necessary due to the nature of field operations. However, they agreed that site visits can be scheduled efficiently, suggesting that travel frequency can be reduced without compromising performance.

The study also found strong agreement that reducing travel leads to lower fuel consumption and transportation cost. Hybrid work was considered feasible, although respondents highlighted the need for clear guidelines, monitoring systems, and improved digital infrastructure.

Overall, this reflects an average fuel savings of about 37-38% compared to current consumption levels. The findings suggest that minimizing travel through hybrid work significantly contributes to fuel efficiency while maintaining operational feasibility.

### **IV. CONCLUSION**

The study concludes that hybrid work arrangements are a viable strategy for reducing field consumption among DPWHNE1st DEO field personnel. While fieldwork remains essential, a significant portion of tasks can be performed remotely, leading to reduced travel frequency and operational costs.

Hybrid work enhances efficiency and productivity; however, its success depends on proper implementation, including structured policies, effective scheduling, and the availability of digital tools. Therefore, hybrid work can serve as a practical solution to address fuel-related challenges in field-intensive government agencies.

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