

**A Tool to Track U.S. Infrastructure Maintenance**

**The Ambitious Expectations Contributing to the Monstrous F-35 Budget**

A Thesis Prospectus

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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## **General Research Problem**

*Waste and improper allocation of the government's budget are problems of almost all bureaucracies.* In the United States specifically, The Department of Defense is notorious for its large budget and wasteful spending at the same time as U.S. infrastructure is in dire need of upgrade and maintenance. To put things into perspective, the United States, as of 2020, has an annual defense budget of \$778 billion, greater than the next 11 countries combined (“U.S. Defense Spending,” 2021), while its infrastructure is at an over \$2.5 trillion spending shortfall over the next ten years (Schaper, 2021). In this prospectus, I hope to analyze a famous example of defense overspending with the F-35 project, specifically looking into the policies and expectations that caused the overspending and propose a tool to monitor spending and structural issues on outdated U.S. infrastructure. Both topics relate to how the United States government uses taxpayer dollars for public programs and can potentially address how to keep the government responsible and accountable.

## **A Tool to Track U.S. Infrastructure Maintenance**

*How can the United States provide a tool or database that assists in infrastructure upkeep?* The infrastructure of the United States is largely failing, exemplified by aging bridges, tunnels, and grid failures. As of 2021, 42% of all bridges in the United States are over 50 years old while about 7% are structurally deficient, according to the American Society of Civil Engineers (Schaper, 2021). The same society gave overall U.S. infrastructure a C- in its infrastructure report card, citing the lack of significant U.S. investment in maintenance for over 50 years and an over \$2.5 trillion spending shortfall over the next 10 years, and estimated that the United States will lose \$10 trillion in economic growth by 2039. However, new spending has

been signed into law in late 2021 with the Infrastructure Investment and Jobs Act (The White House, 2021), so some of these problems can be addressed.

This surge in spending will require many agencies, states, and localities to coordinate and identify projects to fund. On top of that, the act will require the establishment of many new federal programs that will also need further planning for new labor, public review, and supply chain issues (Tomer et al., 2022). To aid in the maintenance of U.S. infrastructure with this new spending, I propose the creation of a centralized database that catalogs issues in key U.S. infrastructure categories. More specifically, I propose a tool that can be used by civil engineers and government agencies to better catalog what work has been done, when last work has been done, how much money has been spent, etc. on specific bridges, tunnels, water systems, etc. This tool can be a website or smartphone application that can be used to look up specific projects where a civil engineer can catalog and view necessary information. Such a tool would allow more proper allocation of funds for current and long-term maintenance due to the availability of the data and specific record keeping of vulnerabilities in infrastructure. Furthermore, a centralized location for such data will streamline communications between agencies as everyone relies on the same tool for information.

As a student, the data I have access to is very limited, so the prototype I hope to develop would be indicative of the type of tool I wish to be built. The prototype will most likely be a website that has scraped Google Maps data for specific infrastructure items such as bridges and tunnels. There will be gaps in information with regards to maintenance, but I hope to fill in what I can with any public records and reports. The website will also have login functionality to allow officials to update its database. The final product that I will develop will be bare bones, but I will implement it in a way that allows it to be updated easily. The user interface will be drawn up

using a tool like Figma and the website will be implemented using the Django web framework, will be hosted on Heroku, and will be continuously integrated using GitHub. The website will be updated constantly so an agile approach to development will be ideal; The goals of the project and changes to the project will be considered and programmed every two-to-four-weeks.

In the future, the application can be expanded to include more information, more types of infrastructure, and be accessible from more than one platform. The product will also require robust security, far over my scope and knowledge, as there will be risks of data breaches from nefarious actors.

## **The Ambitious Expectations Contributing to the Monstrous F-35 Budget**

*What decisions, policies, and expectations have led the United States' F-35 combat aircraft project to far exceed its initial budget goals?*

The F-35 program is a project by the United States and Lockheed Martin to create the next generation of military jets with the express purpose to be a plane adapted to the needs of the Navy, Airforce, and Marines. Such an ambitious project required the plane to be able to fly at supersonic speeds for the Airforce, have short take offs and vertical landing for the Marines, and be able to land on aircraft carriers for the Navy. Naturally, the project was split up into three models for the branches with the hopes that there would be high similarity between the three models to reduce costs of maintenance (Tegler, 2021, para. 7). This proved to be a false hope as through development, engineers discovered that some requirements of the plane made it difficult to fulfill the requirements of other branches. The lifetime maintenance and operations projection of the program soon began ballooning to over \$1 trillion by 2015, raising alarms on Capitol Hill. This was not the first time where cost issues were raised either as in 2010, an increase in projected procurement costs that far exceeded the original baseline resulted in the invocation of

the Nunn-McCurdy Law (Congressional Research Service, 2022), a law requiring that Congress be informed when military costs become too great. The government ultimately decided against the cancellation of the project in both cases due to its international commitments, high expectations, and, most importantly, the commitments of almost all 50 states with providing supplies to the program (Insinna, 2019).

The F-35 program is one significant example of the lack of transparency and budgetary bloat of the U.S. Department of Defense. It would be in the best interest of the American population to reduce waste in government expenses as it is the American population who funds such research with tax money.

#### *Key Groups Involved and Their Roles*

The research I hope to perform will primarily focus on the misguided and overly ambitious goal of having high commonalty between the three models of the F-35 project. There are six key groups involved in this decision: the United States Department of Defense, which encompasses the U.S. Navy, Airforce, and Marines, The United States Senate Committee on Armed Services, The United States House Committee on Armed Services, and the Lockheed Martin Corporation. The United States Department of Defense is the government organization paying for and contracting the company that makes the F-35. It is America's largest government agency, with a budget of over \$740 billion dollars and its agenda is clear, the defense of the United States. To be more specific, the Department of Defense's agenda was creating a plane suited for the needs of the Marines, Navy, and Air Force to update its previous fleet while at the same time having high commonality between the models. The research that needs to be done further with respect to the D.O.D. can include how much oversight it had over Lockheed Martin, what each branch of the military expected with the project, how they communicated these

expectations, and the key leaders involved with the F-35 project within the department, including military leaders and members of the President's cabinet. The United States Senate Committee on Armed Services and The United States House Committee on Armed Services are Congressional committees that oversee the U.S. military and its research (Wheeler, 2011). The two committees are the key Congressional players in the F-35 development cycle as their roles are legislative oversight of the Department of Defense, meaning they inform Congress and the public so that decisions can be made. For further research that relates to two committees, it would be important to find Senate and House hearings about the F-35, specifically progress reports on the promise of high commonality, the reasoning behind the continued Congressional support of the F-35 project despite the continued problems, and the political positions of the Senators and Representatives on the committee. Finally, the Lockheed Martin Corporation is the private entity in charge of developing and researching the F-35 fighter aircraft. Being a for-profit organization, the agenda of Lockheed Martin is to provide profit for its shareholders. Further research into the Lockheed Martin Corporation can be the steps that the company took that can be considered inefficient for development or research, the key leaders in the F-35 project, and its interactions with the Department of Defense and the previously discussed Congressional committees with regards to oversight; This last point will primarily focus on how Lockheed Martin communicated their progress on the commonality goal such as any ambiguity in their messaging and what decisions they made to in order to fulfill the expectations of the three branches discussed at the expense of the commonality goal.

I hope that this research paper will accomplish its task of providing a general overview on the interactions between the United States Congress, the Lockheed Martin Corporation, and the Department of Defense that led to the problems that plagued the F-35 project. To be more

specific, I hope to understand how the expectation of high commonality between the models affected the interactions between the main actors discussed and how much this goal affected the delays and budget overruns prevalent in the project. By understanding these issues, the United States and its government will be able to learn from the mistakes of the F-35 and apply necessary changes to the development of future projects.

## **Overall Conclusion**

Both the analysis of the F-35 project and the U.S. infrastructure investment and record keeping are directly related to government spending. By analyzing the F-35 project I hope to find persistent practices that result in spending waste and with the infrastructure tool, I hope to provide a means to mitigate spending waste. For further research into government spending, specifically inefficiencies in government spending, I propose looking at California's high speed rail project and the policies and oversight that led to its bloated budget and eventual failure.

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