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This semester, my project about the NYC subway and CBTC changed the way I think about writing, engineering, and problem solving. At the beginning of the semester, I only thought about the subway as a way for people to travel. I did not think much about how train systems work or why delays happen so often. Through this project, I learned that transportation is not just about trains moving from one place to another. It is also about safety, planning, technology, and communication.

My portfolio project about Communications-Based Train Control, or CBTC, was one of the most important parts of my work this semester. Before this class, I did not know much about subway signaling systems. I only knew that subway delays were a big problem in New York City. After researching this topic, I learned that the old fixed-block system causes trains to stay too far apart and slows down service. CBTC is a better system because it uses wireless communication to track trains more accurately and keep them moving more smoothly.

In this project, I explained how CBTC works and why it is useful. I learned that it sends information between trains and trackside computers so the system always knows each train's position and speed. This allows the system to create a moving block instead of fixed sections of track. That means trains can safely run closer together. I also learned that some CBTC systems use GNSS to improve train location accuracy,

especially on outdoor tracks. This showed me how technology can solve real problems in the subway system.

Writing this portfolio also helped me improve my writing skills. At first, it was hard for me to organize all my ideas. I had many facts about subway delays, phantom delays, the Enhanced Station Program, and CBTC, but I needed to put them together in a clear way. This class helped me learn how to write more simply and clearly. I also learned how to focus on the main idea and remove extra information that was not necessary. Because of this, my writing became more organized and easier to understand.

Another important part of this project was learning about the Enhanced Station Program. At first, I thought improving subway stations would help solve the whole problem. But after researching it, I learned that the program mostly improved how stations looked, not how trains actually worked. It also faced problems like high costs, infrastructure damage, and ADA issues. This helped me understand that some projects may look helpful, but they do not always fix the real problem. That lesson was important because it taught me to think more carefully about public projects and transportation planning. This semester also showed me that big engineering projects are not easy to complete. CBTC costs a lot of money and takes time to install. It also requires working with the MTA and following many rules. I learned that good ideas are not enough by themselves. A project also needs planning, cooperation, and patience. This helped me understand that engineering is about solving problems in a realistic and responsible way.

Overall, this portfolio shows my growth as a student and writer. It shows how I learned to research a topic, organize my ideas, and write about it in a clear way. I am proud of this project because it shows my effort and improvement. It also taught me that engineering can help make people's daily lives better. In the future, I hope to keep improving my writing and learning more about how technology can improve transportation systems.