

Case Study Rubric – NYC Vision Zero Motor Vehicle Collision Forecasting

Submission format: PDF, via Canvas

General Description: You will create a forecasting analysis for New York City’s Vision Zero Initiative using the data and models provided in the GitHub repository. This analysis uses 11 years of NYPD-reported collision records from the NYC Open Data portal, providing daily and hourly crash counts across all five boroughs. Your goal is to determine which NYC borough is expected to have the highest number of motor vehicle collisions on January 1st, 2026, and to produce an hourly breakdown of predicted collision counts for that borough. You will gain experience using time-series modeling and apply these skills to a real operational context to understand how data-driven decisions can support important safety initiatives.

Why am I doing this? Vision Zero needs accurate short-term forecasts to guide resource deployment, anticipate high-risk periods, and ultimately prevent injuries and fatalities. This assignment will guide you through a full forecasting workflow, from conceptual understanding to model execution to output interpretation. You will also learn to communicate findings clearly and translate real-world data into impactful insights. By performing this analysis using reproducible code from a structured GitHub repository, you will practice the core skills of code documentation and model interpretability. By the end of the case study, you should be able to assess whether your results are accurate, complete, and aligned with the needs of Vision Zero.

- Course Learning Objective: Apply time-series forecasting methods to real-world data.
- Course Learning Objective: Communicate analytic findings clearly and effectively.

What am I going to do? You will use the materials provided in the [GitHub project repository](#) to:

1. Run the borough-level daily Prophet forecasting model to predict which borough is expected to have the highest number of motor vehicle collisions on January 1, 2025.
2. Run the hourly Prophet forecasting model for the identified borough and produce an hour-by-hour breakdown of expected collision rates.
3. Document your workflow, results, and reasoning.
4. Produce the required written deliverable, demonstrating understanding of time-series forecasting and its relevance to Vision Zero.

How will I know I have succeeded? You will meet expectations on the Vision Zero Collision Forecasting Case Study when you follow the criteria in the rubric below.

Formatting	<ul style="list-style-type: none">● 1-2 pages● PDF● Order

	<ul style="list-style-type: none"> ○ Title ○ Name and Course and Date ○ Project Overview (1 paragraph) ○ Data, Tools, and Forecasting (1-2 paragraphs) ○ Results (1-2 paragraphs) ○ Interpretation and Implications (1-2 paragraphs)
Project Overview	<ul style="list-style-type: none"> ● <u>Goal</u>: Demonstrate understanding of the Vision Zero initiative and the purpose of this forecasting task. ● Summarize the real-world problem that Vision Zero aims to address, and explain why collision forecasting is important for public safety. ● Identify the key forecasting question and describe the overarching objective of this case study assignment.
Data, Tools, and Forecasting	<ul style="list-style-type: none"> ● <u>Goal</u>: Show familiarity with the data and resources provided, and clearly outline the steps taken to reach your conclusion. ● Use two paragraphs. ● Paragraph 1 should: <ul style="list-style-type: none"> ○ Identify the NYC Open Data collision dataset and relevant variables. ○ Explain what time-series model is used as the forecasting tool and why. ● Paragraph 2 should: <ul style="list-style-type: none"> ○ Document the full sequence of steps followed (loading data, preprocessing, model training, prediction). ○ Identify how you selected the highest-risk borough based on predicted values. ○ Highlight any challenges you faced during the process.
Results	<ul style="list-style-type: none"> ● <u>Goal</u>: Present and explain the outputs of the forecasting models accurately and clearly. ● Report which NYC borough is forecasted to have the highest number of collisions on January 1, 2026. ● Include the predicted daily collision count for that borough. ● Provide the hour-by-hour collision predictions for that borough (screenshot of model output is acceptable).
Interpretation and Implications	<ul style="list-style-type: none"> ● <u>Goal</u>: Demonstrate your ability to interpret forecasts and translate the findings into action for Vision Zero. ● Explain when and where collision risk in NYC is highest for New Year's Day. ● Discuss how these forecasts might support staffing, enforcement, and safety interventions ● This section should translate technical outputs into practical, actionable insight.