+-MTFC Project Proposal 2025-26

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Team ID #	23917
Short Title for Proposal	Preventing Gun Violence through Analysis of the Connection Between Economic Status and Crimes
Topic Category	Crime ▾

MTFC Project Proposal Template Use Notes:

- *Note that the topic for the Project Proposal is the **team's choice** (i.e., it is __NOT__ intended that you use the 2025-26 Scenario Quest corn farming for your project proposal topic)*
- *Refer to the official MTFC Project Proposal Prompts 2025-26 for the 15 prompts and scoring instructions.*
- *The use of this template is __OPTIONAL__.*
  - *It is provided as an optional resource for teams to keep their Project Proposal response organized. Teams who wish to use this template should make a copy in order to edit.*
- *The final version of the team's MTFC Project Proposal should be downloaded as a PDF or Word document to submit on the ICS Dashboard. A single file will be submitted.*
- *Additional resources (including the Actuarial Process Guide) can be found on the Modeling the Future Challenge website: https://www.mtfchallenge.org/resources/*
- *Please direct any questions to challenge@mtfchallenge.org.*

Part 1: Project Definition *(Team's Topic)*

These prompts can be found on page 3 of the MTFC Project Proposal Prompts 2025-26. Additional information on Project Definition can be found in **Step 1: Project Definition** in the Actuarial Process Guide.

Team Responses:

#1: Identify the topic

In 3-5 sentences, summarize what is the topic your team is proposing to investigate and why is it important. Provide a statement on what the topic is and why it is important. Has it seen a sudden or recent change that brings it to the forefront? Who does it affect, where is it prevalent, is it tied to any other areas of impact?

- Response:

Crime impacts people all across the world. This is a large issue that law enforcement and common people deal with day to day. To combat this, we want to locate a potentially significant root cause of increased crime rates in an area.
We hypothesize that poverty may play a role in the crime rate of a given area. Our topic revolves around how poverty in certain cities and locations affects crime rates. If we find that poverty is a root cause, we want to target that root to fix two problems at once, bringing down crime rates and improving the livelihood of the community
Crime is a global issue, though it has been seen to increase in rates in generally lower-funded areas with a weaker GDP per capita. It impacts everyone in the community: business owners, students, and workers.

#2: Identify potential risks

In 3-5 sentences:
Identify and describe 2-3 areas of risk for an individual, society, or organizations/industry/governmental groups related to your topic. Hypothetically, what could be a "best-case scenario" outcome for the risks identified? What could be a "worst-case scenario" outcome for the risks identified?

- Response:

The worst-case outcome would be that poverty does not contribute at all to school shooting frequency, indicating that there is no correlation between the two. The best-case outcome would be that there is a clear correlation between poverty and crime, suggesting a potential area to target in future crime mitigation strategies. An area of risk to individuals is that they could get hurt due to an increased crime rate. An area of risk to the government is that other countries might not want to support certain countries if they have high crime and poverty rates. This is also the same with tourism coming into the country.

#3: Identify a behavior change risk mitigation strategy

In 1-2 sentences, describe:
A specific behavior change risk mitigation strategy relevant to your topic that could mitigate (lessen the severity of risks you identified is associated with the topic. Identify who (individual, society, organization/government, etc.) would be impacted by its implementation?

- Response:

One risk mitigation strategy would be to start a crime awareness program in schools in more impoverished places. A crime awareness program can reduce the amount of crime because more people will know how death and loss from crimes might not just affect the person killed but also their family, friends, and the world around them.

#4: Identify a modifying outcomes risk mitigation strategy

In 1-2 sentences, describe:
A specific modification to the outcomes risk mitigation strategy relevant to your topic that could mitigate (lessen the severity of) risks you identified associated with the topic. Identify who (individual, society, organization/government, etc.) would be impacted by its implementation

- Response:

One modification to the outcomes strategy would be to start a program for selling dangerous weapons for money. The program lowers the likelihood of gun violence and stabbings as there will be fewer weapons, but it will also help stimulate the market by giving money to the sellers.

#5: Identify an insurance risk mitigation strategy

In 1-2 sentences, describe:
A specific way that insurance as a risk mitigation strategy (relevant to your topic) that could mitigate (lessen the severity of) risks you identified associated with the topic. Identify who (individual, society, organization/government, etc.) would be impacted by its implementation?

- Response:

One insurance strategy would be to increase life and property damage insurance on damages caused by crime. This would lower the risks of losing money and property to crime.

#6: Identify driving research questions for your topic

Driving research questions should each be 1-2 sentences long, and should be probing deeper research and aligned with the goals of addressing the issue of the risk. Thinking about these questions will help you frame your project.

List 2-3 driving research questions whose answers would be needed to mitigate the risk of your project topic.

- Response:
    - **Does the socioeconomic state of a location correlate with the amount of crimes it may face?**
    - **Are there any types of crimes that are especially impacted by poverty?**
    - **What specifically about the impoverished communities drive the need for crime?**

Part 2: Data Identification & Assessment *(Team's Topic)*

These prompts can be found on page 4 of the MTFC Project Proposal Prompts 2025-26. Additional information on Data Identification and Assessment can be found in **Step 2: Data Identification & Assessment** in the Actuarial Process Guide.

Team Responses:

#7: Identifying the type of data you hope to find

As you begin to look for data related to your project, some teams experience a dissonance between what data they hope to find and what data is actually available. It can be easy to lose sight of what data would actually enable your team to explore the project, so articulating the data that you hope to find is valuable.

Describe in 2-3 sentences what the "perfect" or "ideal" data/dataset(s) would be that would enable you to answer and explore the questions you posed. Think about what the data would include – frequency of past events? geographic locations? dates? charts? costs of repairs? financial claims values?

- **Response: A couple of important data points that would be helpful to our research would be poverty rates of a city, crime rates of a city, and the amount of places for people to seek financial and/or emotional help. The poverty and crime rates of a city allow us to identify if there may be a correlation between the two frequencies. The additional data about places that someone could seek financial or emotional help may suggest a cause for this correlation.**

#8: Identify potential data sources for your topic

Since you won't use most of these for the data analysis until the Project Phase, it's important to create a thorough notes for yourself and your mentor on each source to reference later.

Find 2-3 data sources related to the project topic (include links to the sources).
For each data source:
Provide a 1-2 sentence description of the credibility and scope of the data sources and identify which one (or more than one) of the three categories of data from the Actuarial Process Guide (see section 2.1) for more details does the data source fall into.

In 1-2 sentences, describe what data summaries or visualizations your team would be able to do with this dataset in Phase 2: Projects. Examples could include charts, tables, or descriptive statistics (mean/standard deviation/frequency/range, etc).

- Response:

Data sources:

List of top 25 cities in the US based on population:
https://www.britannica.com/topic/Whats-the-largest-US-city-by-population

  This article is from Britannica. Britannica is a highly credible website given its extensive editing process and thorough content. This website was published recently in 2025 meaning the content is up-to-date. The website covers all US cities but does not consider any other countries around the world.
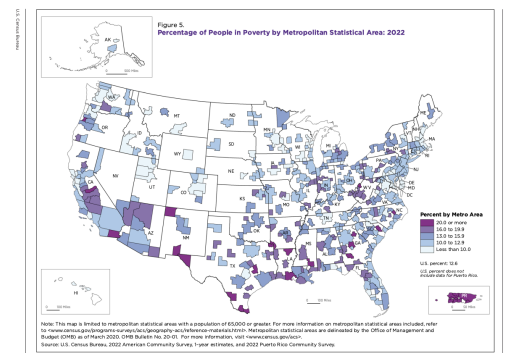
  The information on this website will be used to decide which cities to research further into (poverty rates, crime rates, etc)

Poverty in States and Metropolitan Areas: 2022:
https://www.census.gov/content/dam/Census/library/publications/2023/acs/acsbr-016.pdf

  This is a published paper about poverty rates in the US. It is a highly credible source as it is published by the US Department of Commerce, United States Census Bureau. One flaw is that it may not be 100% accurate as the data is from 2022,2023

  We would be able to take poverty rates from the following image:

Murder/homicide rates by large metropolitan county, 2023:
https://usafacts.org/articles/which-cities-have-the-highest-murder-rates/

  This is a website that has a list of murder/homicide rates by large metropolitan county in the US. The data includes homicide rates (per 100,000 people) and total number of homicides. The information from this website could be compared to the data from the paper above to determine if there is a relation between the two factors.

The Science of Gun Policy: A Critical Synthesis of Research Evidence on the Effects of Gun Policies in the United States
https://pmc.ncbi.nlm.nih.gov/articles/PMC11630101/

  This paper talks about how gun policies have affected the US

Part 3: Mathematical Modeling *(Team's Topic)*

These prompts can be found on page 5 of the MTFC Project Proposal Prompts 2025-26. Additional information on Mathematical Modeling can be found in ***Step 3: Mathematical Modeling*** in the Actuarial Process Guide.

Team Responses:

#9: Modeling research on your topic

In 3-5 sentences, summarize and describe the results of your online searches by answering the following questions:

What kind of results, published papers, and credible literature does this yield? Include links from your findings in your response so you can reference them later.

What is helpful in what you found? What was unfamiliar or beyond the math you are familiar with?

- Response:
  We found published papers and reliable websites when searching for data sources. The links can be accessed in part 2. We got several lists that address poverty rates or homicide rates/total numbers. This will allow us to begin linking the two factors to see if there is any correlation. We were not too familiar with how poverty was measured in the published paper we mentioned in part 2 (source #2). We were confident when analyzing the lists and comprehending the average homicide versus the total number of homicides, etc.

#10: Goals of a mathematical model in the project phase

Note: You won't actually create a mathematical model until Phase 2: Project Phase. For now, you need to identify what you hope that your mathematical model will be able to accomplish. Your mentor in the Project Phase will work with you to actually create a mathematical model.

In 3-5 sentences:

Describe what – ideally – you hope that a mathematical model would be able to do for you?

How could it help you identify the likelihood & severity of risk and the changes over time or other elements that will help you characterize risk?

What kind of mathematical analysis seems to be fruitful to pursue in the Project Phase for your proposed topic?

- Response:
  Ideally, the mathematical model will display a strong correlation between poverty and homicide rates in a given area. This will help us to identify the likelihood of homicide in the area based on poverty rates and allow us to discover potential strategies that target poverty to have an impact on homicide occurrence. Some mathematical analyses that may be useful during the project phase could be averages and trends across data concerning homicide rates and poverty levels.

#11: Assumption development

In this stage of the proposal process, you are still operating at a very "high level" of project overview and you will tackle your project at a deeper level in the Project Phase. Even at this stage, however, you have conducted enough initial background research to be able to begin formulating assumptions that will allow you to formulate recommendations you have suggested in your problem statement.

In 1-2 sentences each, address some initial assumptions that you anticipate that need to be made in order to provide a framework for your model.

-       What is the appropriate future time period for your analysis? That is, how far out into the future do you anticipate needing to consider for the risk and the mitigation strategy to take effect? What leads you to consider this a rational and logical assumption?

-       How do you expect your data to change over that time period? Will the rate of change be the same or different from the historical rate of change or trend? What leads you to consider this a rational and logical assumption?

- Response:
        Our project time period should be able to analyze and utilize patterns in poverty change rates to estimate future crime rates indefinitely. The model should be able to estimate up to several years into the future at a time, but be malleable to use at any given time.

        We expect that the rate of change will increase, where there is a sharper decline in homicide rates after a strategy has been implemented based on the data we identify. Since we are targeting poverty rates in an attempt to lower homicide rates, assuming the model is effective, homicide rates will go down.

Part 4: Risk Analysis *(Team's Topic)*

These prompts can be found on page 6 of the MTFC Project Proposal Prompts 2025-26. Additional information on conducting a Risk Analysis can be found in **Step 4: Risk Analysis** in the Actuarial Process Guide.

Team Responses:

#12: Goals for mitigation strategy
- Response:

In 2-3 sentences, consider potential outcome scenarios for the risk(s) you identified in Step 1: Project Definition.

- Based on your background research, what does the current trajectory and forecast of the risks for your topic lead to if no interventions are made?

Places currently dealing with extreme crime rates likely will continue to decline if there is no new strategy to target these concerns. A new correlation between crime and poverty may provide some insight on ways to mitigate the need or want for criminal activity.

- What would be the goal and hope for the impact that the risk mitigation strategy would have?

Discover the correlation between extreme poverty and crime, gun violence. This may provide a new strategy for targeting crime rates.

Part 5: Recommendations *(Team's Topic)*

These prompts can be found on page 7 of the MTFC Project Proposal Prompts 2025-26. Additional information on making Recommendations can be found in **Step 5: Recommendations** in the Actuarial Process Guide.

Team Responses:

In the Project Phase, you will ultimately select one risk mitigation strategy to characterize and recommend. The strategy you choose will depend on a variety of factors (and you'll need to justify why you pursue one risk mitigation strategy over another). For now, revisit the risk mitigation strategies identified for your topic in #3-5 from Step 1: Project Definition responses of this Project Proposal.

In 2-3 sentences, what metrics do you anticipate being helpful to prioritize which one of the three risk mitigation strategies to pursue when you fully model your project in the Project Phase of the MTFC (e.g., cost, effectiveness, ethics, complexity, timeframe, etc.)? What rationale leads you to your response?

"One risk mitigation strategy would be to start a crime awareness program in schools in more impoverished places. A crime awareness program can reduce the amount of crime because more people will know how death and loss from crimes might not just affect the person killed but also their family, friends, and the world around them.

(given that there is a correlation,) Building accessible grocery stores and other necessary buildings in poverty stricken areas, decreasing the need/want to commit violent crimes

One modification to the outcomes strategy would be to start a program for selling dangerous weapons for money. The program lowers the likelihood of gun violence and stabbings as there will be fewer weapons, but it will also help stimulate the market by giving money to the sellers.

One insurance strategy would be to increase life and property damage insurance on damages caused by crime. This would lower the risks of losing money and property to crime."

Some metrics that may be helpful to consider may be price of weapons, percentages of people with weapons, people who are violent. Additionally, an area's overall poverty rate and quality of living should be a quantified value by comparing an area's pre-tax cash income to a poverty threshold. This is not exactly a unit of measurement but it will be helpful to take note of any clusters of gun violence to see if there are patterns.

PROMPT #13: RECOMMENDATION DIFFERENCES BETWEEN MITIGATION STRATEGIES
MODELING THE FUTURE CHALLENGE 2025-26 • SCENARIO PHASE • PROJECT PROPOSAL PROMPTS • PAGE 71: PROBLEM DEFINITION2: DATA I'D & ANALYSIS3: MATH MODELING4: RISK ANALYSIS5: RECOMMENDATIONS
There may be two different groups to consider when formulating a recommendation for action: those who actually are facing the risks and those who are in a position to do something about mitigating those risks. It's possible that those at risk are the same who may be in a position to enact change, but it is possible that they will not be.
In 1-2 sentences, identify one potential target audience for your recommendations who may be in a position to make decisions based on your recommendations (e.g., based on financial investment or authority to enact change). What rationale leads you to identify this audience? Explain.

A potential target audience for our recommendations could be state or governmental figures who have the ability to manipulate education curriculum to potentially implement further education on gun violence and/or general weapon safety and responsibility, what risks are present and how to avoid them. Governmental figures may also be beneficial to target as a risk mitigation strategy mentioned above consisted of selling these weapons to decrease the overall concentration of weapons in the general public. Mayors or state representatives (people of higher power more localized) would be beneficial to focus change on a couple of high-need locations that may be identified throughout this project.

PROMPT #14: AUDIENCE FOR RECOMMENDATIONS
Ultimately, the goal of your MTFC project is to model the future and recommend a strategy to improve the outlook
for the future for your project topic.
In 3-5 sentences, summarize what improvements would you hope your recommendations would lead to for your project topic (ie, what is your best case scenario outcome)? Explain.

There <u>will</u> be a correlation between poverty and gun violence in an area. This is the best outcome as there will be a strong relation between the two, indicating that we can target one and likely impact the other. For example, by building grocery stores, etc people will have more resources accessible, potentially decreasing the want for violent behavior.

Ideally, the people of higher power will see the need for this change in a given community. They will act as soon as possible to implement further education on weapon safety and responsibility in all age groups, informing the community on how to safely handle the weapon <u>and </u>what to do when faced with one by another person (self defense, etc). Necessary buildings such as grocery stores, laundromats, etc will be built in the high-need areas and decrease the need for criminal activity. People will sell their weapons to some organization (exactly tbd) , earning some cash and lowering the general density of guns in an area.

PROMPT #15: GOALS FOR SITUATION IMPROVEMENT
Ultimately, the goal of your MTFC project is to model the future and recommend a strategy to improve the outlook
for the future for your project topic.
In 3-5 sentences, summarize what improvements would you hope your recommendations would lead to for your project topic (ie, what is your best case scenario outcome)? Explain

With the strategies mentioned above, we hope to see a decrease in the density of guns in an identified area. Additionally, with more accessible buildings and resources, we expect a decrease in the need or want to participate in violent crime and activity.

By implementing more gun awareness and general weapon education, people will deeply understand the risks of violent behavior and see the depth of the situation, preventing them from participating in these themselves. This program should also teach students how to protect themselves in a potentially dangerous situation where they are faced with a person wielding a dangerous weapon.