1.0 Introduction to the Challenge

Accidents in McFarland

It is recommended to play each video twice—(first time wow factor, second time—take notes)

The people of the town of McFarland have an accident problem at the corner of Main Street and Park Street. During the past year, this heavily used intersection near downtown has been the site of several dangerous accidents involving large tractor-trailer trucks hitting smaller cars. Many of the accidents resulted in severe injuries and cars that had to be scrapped and totaled. That is, the cars could not be fixed and used again. There have even been some fatalities as a result of these car accidents. Your challenge is to assist the town of McFarland to understand why the accidents are causing more damage and injury. You will determine the factors that lead to such accidents and explore possible solutions to the challenge.
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To understand more about the dangerous intersection, review maps of the area (full-size maps are available in your student packet):

Map 1: Birds-eye view of the entire McFarland area, with the intersection circled
Map 2: Close-up view of the intersection of Park and Main.
Map 3: Final location of cars struck by the trucks during accidents in the previous year
Map 4: Final location of cars struck by the trucks during accidents this year

NOTE: The on-ramp the trucks use is a 40-foot downhill run from the factory to Park Street

*Make sure to put the posters of the maps in a central location in the classroom---the students will be referring to these maps often throughout the challenge.
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Engineers are professionals who solve challenges like McFarland’s. An engineer is known as a person who, given a problem and a specific set of goals, finds a solution to the problem that satisfies those goals with the given materials, time, and resources. They apply their scientific and mathematical knowledge to develop a solution to a problem or challenge through these methods called the engineering design process.

- Defining a problem (Asking questions and Identifying criteria plus constraints)
- Designing and evaluating multiple solutions
- Optimizing a solution

Engineers may design new materials or structures, or they may develop new products and processes. Traffic Engineers examine traffic safety by investigating locations that have high accident rates and work on developing methods to reduce the number of car crashes at these locations. In order to help the town of McFarland, you will address the challenge as a traffic engineer would.

Watch Video 2