Background

Structural FRP composites are being considered for usage in civil infrastructure applications.

Perceived Advantages:

- **lightness**
- **durability**
- **damping characteristics**

Perceived Disadvantages

- **mechanical performance characteristics**

Research Objectives

Find better arrangements of fibers in composites to improve overall mechanical performance.

Explore possibilities systematically using analytical/computational methods.

Improve methods for analysis of composite materials.

Prototype and test the best material designs to verify.

Stiffnesses & Strengths of Aligned Fiber Composites are Highly Anisotropic

Elastic Moduli (GPa)	Glass (50/50)	Graphite (50/50)	Steel
C_{1111}	38.29	129.0	268.8
C_{2222}, C_{3333}	8.81	10.4	268.8
C_{1212}, C_{1313}	3.32	3.57	76.9
C_{2323}	2.60	2.67	76.9