An aerial photograph of a winding asphalt road that curves through a dense, green forest on a steep, rocky hillside. The road is light-colored and contrasts with the dark green of the trees. The background shows more of the forested mountain range under a clear sky. The text is overlaid on a semi-transparent brown rectangular area on the left side of the image.

# ENGINEERING DESIGN PROCESS

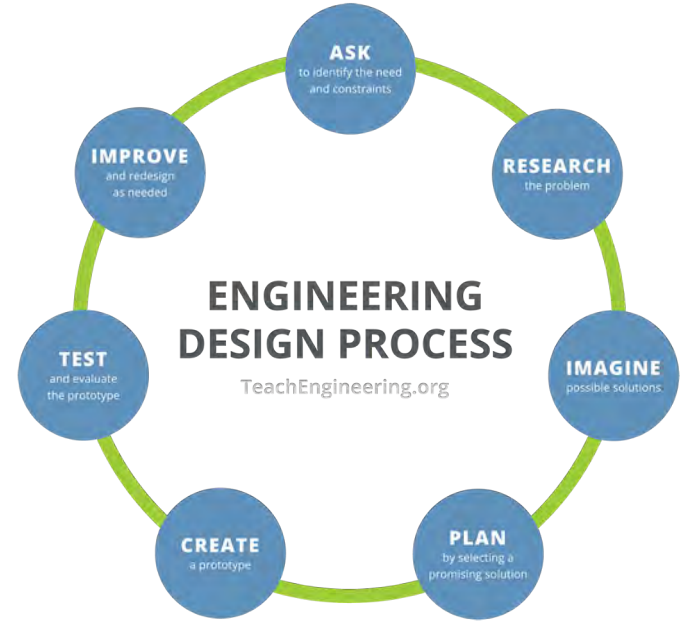
Environmental Science

# Engineering Design Process

## Engineering Design Process -

Series of steps that guide engineers to solve problems.

The process is repeatable.



**01**

**Ask**

**7 STEPS**

**02**

**Research**

**03**

**Imagine**

**04**

**Plan**

**05**

**Create**

**06**

**Test**

**07**

**Improve**

## Step 1: Ask

Identify the needs and constraints of a problem



## Step 1: Ask

What problem is needing to be solved?

Who is it for?

What are the requirements for success?

# Step 2: Research

## Step 2: Research

Research the problem  
and find resources

Who are the experts?

What information is already  
known about the problem?

## Step 3: Imagine

Brainstorm ideas that could solve the problem.



List all possible solutions

Build off of others ideas

**Step 3: Imagine**

# Step 4: Plan

## Step 4: Plan

Choose one solution  
and make a plan

Choose the most  
promising design and  
begin planning for a  
prototype.



## Step 5: Create

Create a model of your solution.

Use your creativity to make your idea real

Model should be accurate to your idea

**Step 5: Create**



# Step 6: Test

## Step 6: Test

Test your model and evaluate the results

Test your model to see how it performs

Evaluate how well your model did based on the success criteria outlined in step 1



# Step 7: Redesign

## Step 7: Improve

Redesign your solution/model to make it even better



What went well on your model?

What didn't go well?

How can we change it to make it even better than before?

# Engineering Design Process



## The work is never done...

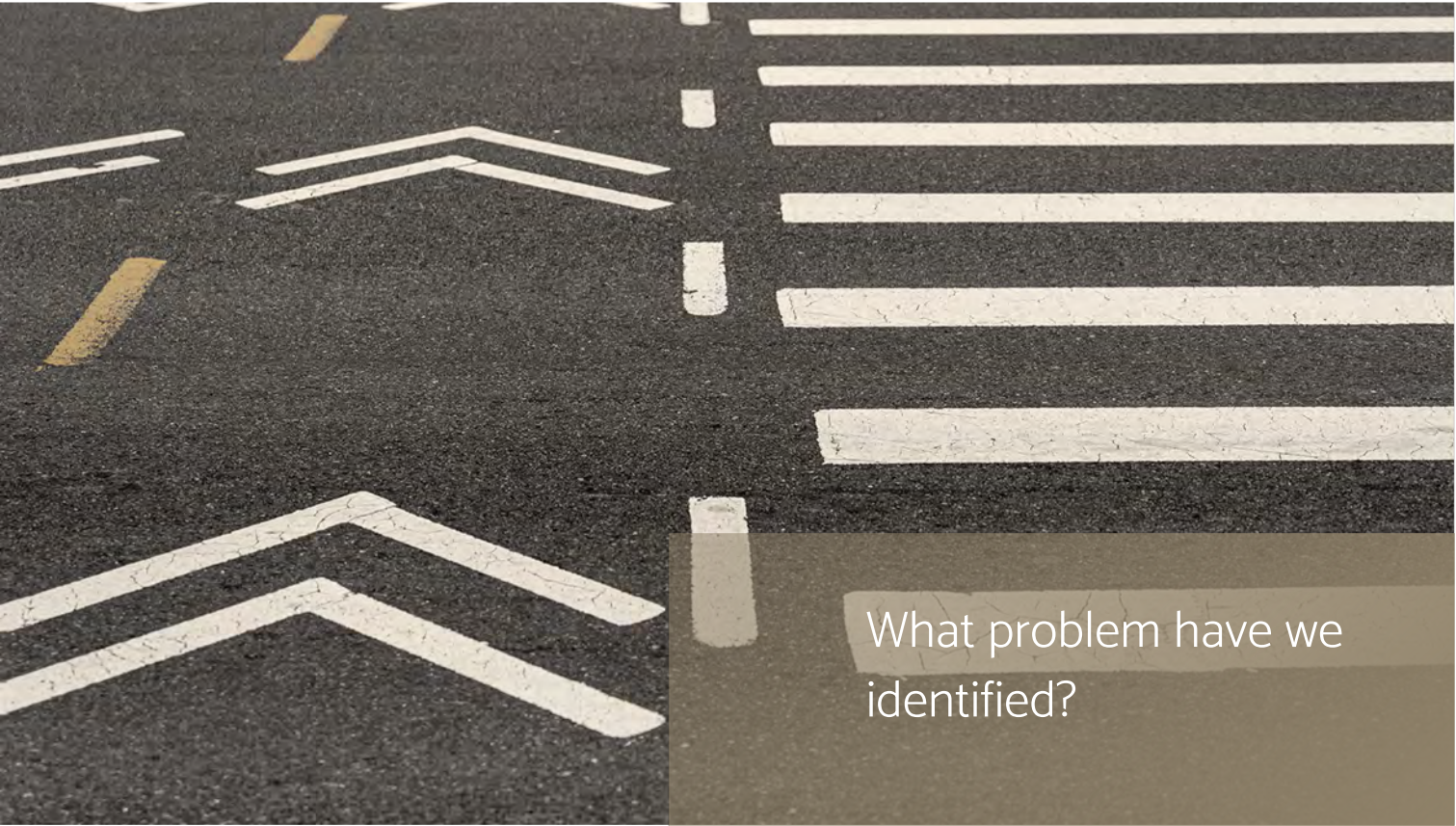
The engineering and design process can repeat as many times as needed to accomplish the goal. Good engineers evaluate their solutions over and over, looking for ways to improve on a design.



## In Action

What does this process look like when designing a road network?





What problem have we identified?

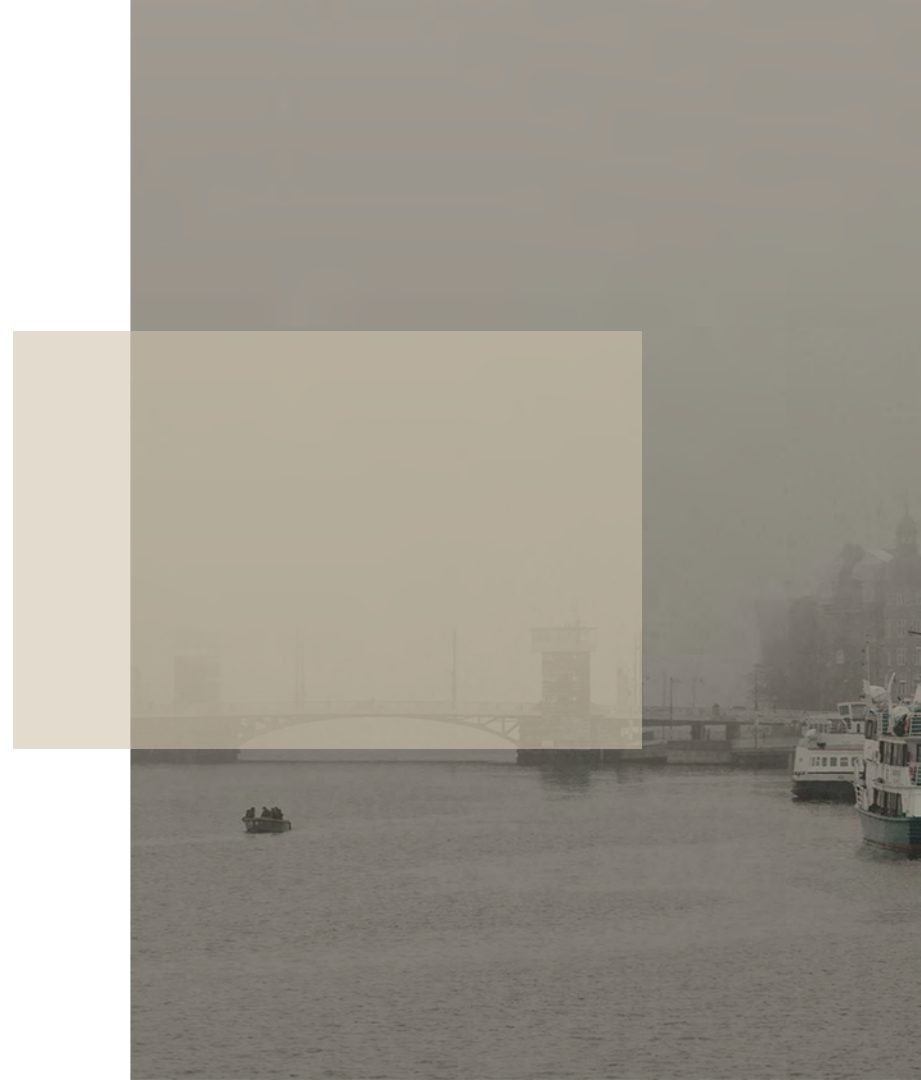
**Process**

# Research

Once we've identified our problem,  
we need more information.

What type of information might  
help us solve the problem?

Where can we find the  
information?





# What comes next?

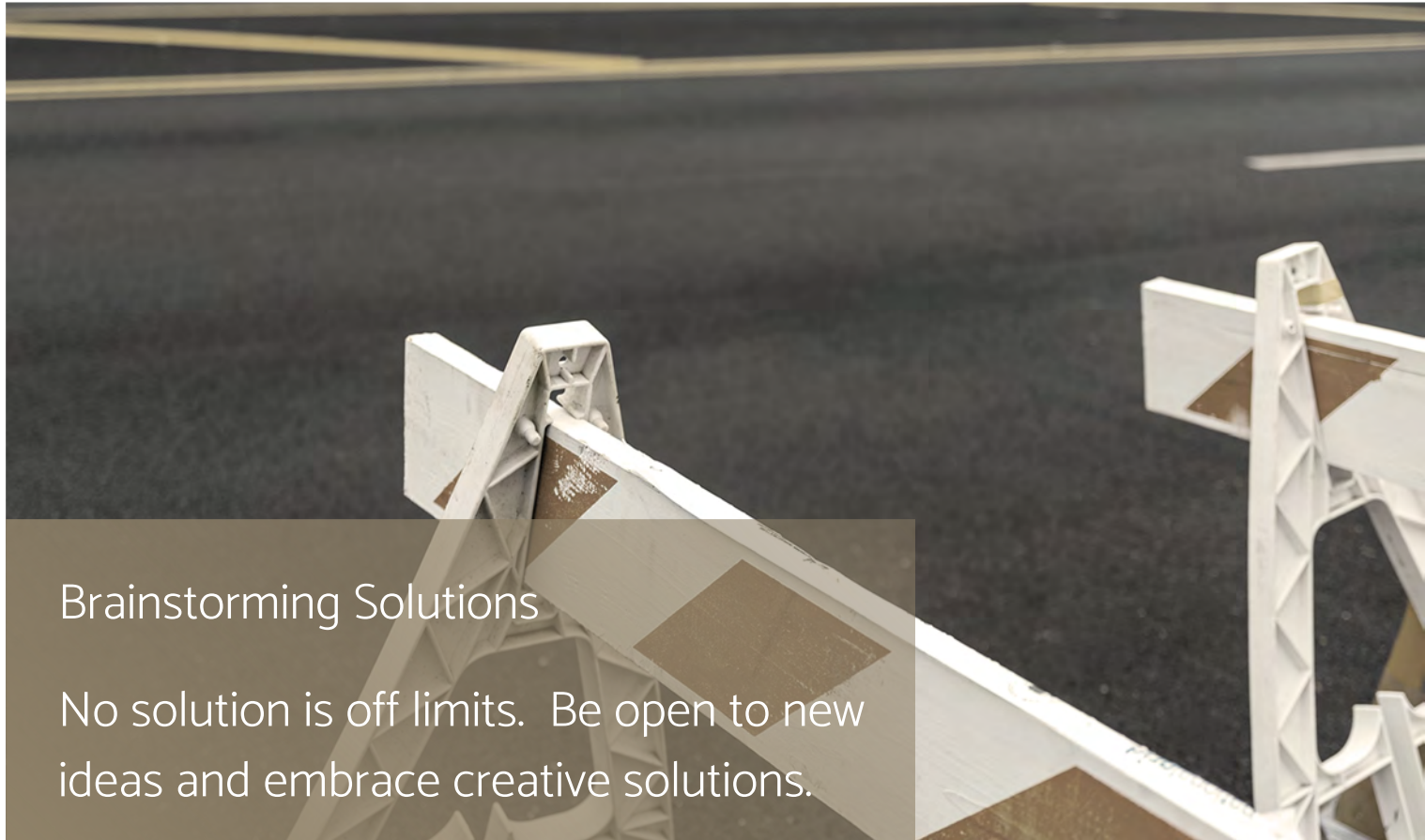
After your research is complete, what comes next?



# Preview

## Brainstorming Solutions

No solution is off limits. Be open to new ideas and embrace creative solutions.







## Question #1

Which step in the Engineering Design Process is most important? Why?



## Question #2

Which step in the Engineering Design Process is the most difficult? Why?