

# Paving the Way to Success

## GSWCF Council Patch Program | DBJCSA

Have you ever wondered about the roads you travel on every day? From ancient Roman pathways to modern highways, roads have always connected us.

Earn this patch by learning more about the roads you use, and help pave the way to a better future!

### **Purpose:**

When I have earned this patch, I will know more about civil engineering, asphalt and the impact of roads on my community. I will know more about career opportunities in STEM & construction, and gain resources to advocate for better infrastructure within my community.

### **Steps:**

1. Connect with our Roads
2. Discover Asphalt
3. Connect with Ajax Paving in the Community
4. Explore Careers with Ajax
5. Take Action



# STEP 1

## Connect with our Roads

Look around—there's probably a road nearby, whether you're at school or home. Roads are everywhere, helping us get to school, parks, stores and even vacation spots. Local roads connect us to our community, while state and interstate highways link us to places all over the country. Roads are vital for accessing essential services, supporting the economy and helping in emergencies.



## Safety on Our Roads

Lean more about  
road safety here



Understanding road safety is crucial for everyone, whether you're a pedestrian, cyclist or driver. Roads are essential for connecting our communities, but they can also be dangerous if safety rules are not followed. As a pedestrian, always use crosswalks and pedestrian signals when crossing the street. When riding a bicycle, always wear a helmet and follow the same traffic rules as cars. For those who are learning to drive, it's important to follow all traffic laws, including speed limits and stop signs. You can help improve road safety in your community by advocating for better road signs, crosswalks and traffic signals.

# Did You Know?

The oldest known paved road is found in Egypt and dates back over 4,600 years. It was used to transport basalt blocks from quarries to the construction sites of pyramids.

President Eisenhower is credited as “The Father of the Interstate System.”

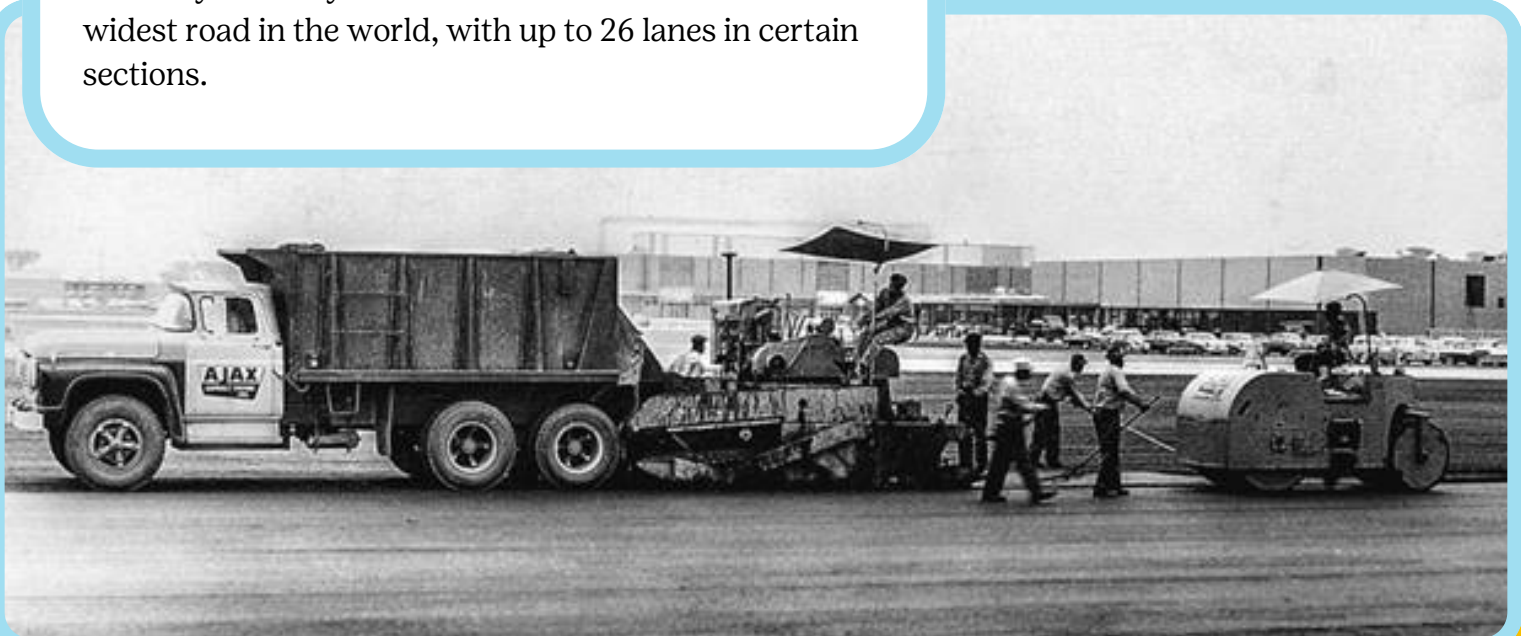
In the late 19th century, steam-powered rollers and horse-drawn graders made road construction faster and more efficient.

Modern roads are built in layers, including compacted soil, aggregate and asphalt, to ensure durability and longevity.

Roads change with the weather—expanding when it’s hot and shrinking when it’s cold. Engineers add special expansion joints to keep them from cracking.

Some roads are built with special materials that let rainwater soak through, helping to reduce puddles and erosion.

The Katy Freeway in Texas holds the record for the widest road in the world, with up to 26 lanes in certain sections.





# Girl Scout Road Bingo

As you travel on the road as a passenger, find as many of these signs and objects as you can to complete a row or the entire card!

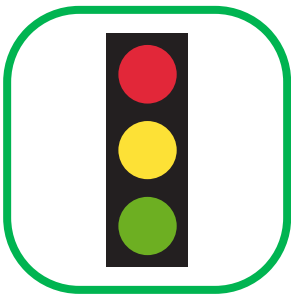
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# Asphalt in America

There are nearly 2.3 million miles of paved road in the U.S., and over 90% is paved with asphalt.

The American Interstate system includes 46,876 miles of roadway.

Asphalt is America's most recycled product, with the asphalt industry recycling asphalt at a rate of 99%.

90% of all parking spaces are asphalt.

Edmund J. DeSmedt, a chemist from Belgium, was the first to lay down real asphalt pavement in the United States in New Jersey in 1870.

The first asphalt patent was submitted by Nathan B. Abbott from Brooklyn, New York in 1871.

## STEP 2

# Discover Asphalt

Civil engineering is a critical field that includes the design, construction, and maintenance of the physical and naturally built environment.

This includes not just roads, but also bridges, buildings and other infrastructure. Among these, road construction is a pivotal area of focus because it directly affects daily lives and our connection to our community.

Asphalt is an amazing material that makes our roads smooth and strong while also being relatively easy to maintain. Asphalt is primarily made from a mix of **aggregates**—such as sand, gravel, and crushed stone—bound together with **bitumen**, a dark, sticky substance derived from crude oil.



# Roads have Layers!

A road is an engineered surface made up of different layers, each with a specific purpose.

The **Embankment** or natural soil layer is the bottom of the structure. It can be made of natural or imported dirt and is compacted by machines to provide a solid, dense foundation.

The **Base Course** is the most important layer of the structure and is responsible for drainage and support of the entire roadway. Its materials are carefully selected by engineers based on local availability and strength to provide the highest level of performance. Base thickness is determined by computing the number and size of vehicles that will use the road.

The **Surface Course** is the layer you see daily. It is usually made of asphalt and provides a smooth, safe surface for vehicles to drive on. Engineers design the surface course thickness and specific composition to meet the needs of each individual roadway.



# Making Asphalt

## Ingredients of Asphalt:

**Aggregates:** Sand, gravel, crushed stone and slag, recycled asphalt

**Bitumen:** A sticky, black and highly viscous liquid or semi-solid form of petroleum



## Steps in Making Asphalt:

### Step 1: Heating

Aggregates are heated and dried in a drum.

### Step 2: Mixing

Heated aggregates are mixed with hot bitumen in a mixing drum.

### Step 3: Transporting

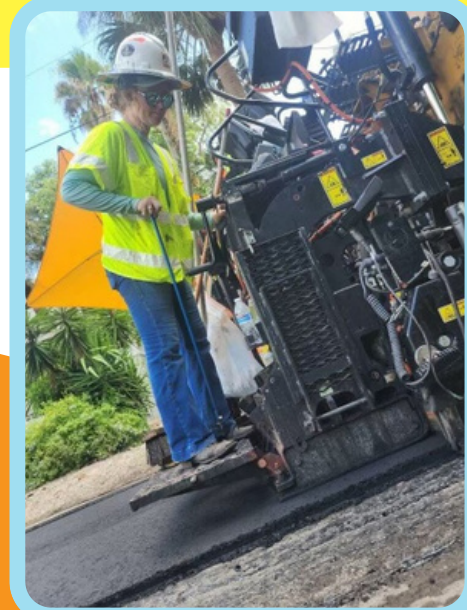
The hot asphalt mixture is transported to the construction site.

### Step 4: Laying

The asphalt is laid down using a paving machine.

### Step 5: Compacting

Rollers compact the asphalt to achieve the desired density and smoothness.





CHOICE - Choose One:

Let's Make Asphalt Cookies

Similar to how asphalt binds together rocks to create strong roads, these cookies start as a gooey mixture that solidifies into delicious treats. As we heat up our chocolate "asphalt" binder and watch it transform, we'll learn hands-on how pavement is made—and enjoy a tasty treat along the way!

**OR** •••••

Dive Deeper into Asphalt:  
Tasty Alternatives

Get ready to build your own mini-road and explore the fascinating world of civil engineering!

Check out page 12 to guide you through this activity



## Recycling & Sustainable Practices

Old asphalt can be recycled by removing and processing to create new pavement, reducing the need for fresh materials.

Modern asphalt techniques, such as warm-mix asphalt, reduce energy consumption and greenhouse gas emissions. Porous asphalt can help manage storm water runoff, reducing the risk of flooding and water pollution.

These innovative methods contribute to making road construction more environmentally friendly while maintaining the durability and quality of the roads.

Scan to find out more!



# Chocolate Asphalt Cookies

## Asphalt Model -Recipe & Instructions

*Serves 15 - Make sure to read all instructions before starting!*

### Ingredients:

- 1/3 cup cocoa powder
- 1/2 cup milk
- 1/4 pound butter (1 stick)
- 2 cups sugar
- 1/8 cup rice crispy cereal per serving
- 1 tablespoon walnuts per serving
- 1 tablespoon coconut per serving

### Basic Supplies:

- Medium or large stove pot
- Medium mixing bowl for each Girl Scout
- Mixing spoons for each Girl Scout
- Square baking pan

### Instructions:

#### Step One:

In a medium or large pot, combine:

- 1 cup cocoa powder
- 1 1/2 cups milk
- 1/2 pound (2 sticks) butter
- 4 cups sugar



Heat over medium heat, stirring frequently, until the mixture comes to a boil.

Boil for 2 minutes, then keep on simmer until step four.

#### Step Two:

While the chocolate "asphalt" mixture is still warm, divide the rice crispy cereal, chopped walnuts, and flaked or shredded coconut into equal parts for each Girl Scout participating.



**girl scouts**  
of west central florida

### Try Making Them Your Own!

Granola, rice crispy cereal, raisins or dried cranberries make great substitutions

## Cookie Instructions Continued:

### Step Three:

Each Girl Scout should have their own bowl, in each bowl divide the following evenly with approximately:

- Equal parts rice crispy cereal
- Equal parts chopped walnuts
- Equal parts flaked or shredded coconut

### Step Four:

Evenly pour equal parts of the warm chocolate asphalt mixture into each bowl.

Each Girl Scout should stir until all ingredients are well coated and the mixture starts to stiffen as it cools.

### Step Five:

Once mixed, each Girl Scout should pour and mound her mixture onto a square of wax paper.

Cover with another square of wax paper and use a 16 oz. sealed can or rolling pin to roll the mixture out to a 1/4" to 1/3" thickness

### Step Six:

Allow the cookies to cool and harden completely on the wax paper.

*Serve chocolate asphalt cookies once cooled, and pave the way to a sweet adventure!*



# Build your own Sweet Road: Tasty Alternatives



There are many layers to a road- here's a fun way to build all the layers using sweeter alternatives.

## Suggested Materials:

- 1 & 1/4 cup Old fashioned rolled oats= natural ground
- 1/2 cup Shredded coconut= sweetener
- 1/2 teaspoon Vanilla Extract= "moisture"/ stabilizer
- 1/2 cup Chocolate chips= base
- 1/4 cup Honey= tacking
- 1 cup Peanut Butter= asphalt
- Measuring Cups
- Spoons
- Clear container or glass bowl

## Activity Steps:

### Step 1: Mix your stabilizer

In a clear container, or glass bowl create the first layer (Stabilizer).

Add 1 ¼ cup oats (natural ground) add ½ cup coconut flakes (sweetener).

Add in ½ tsp vanilla extract to increase the moisture.

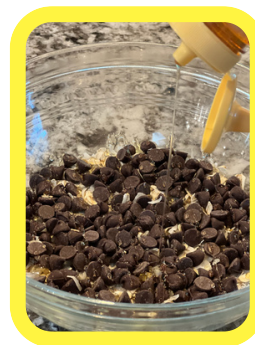
Mix these ingredients to create a stronger Stabilizer.

### Step 2: Build your road layers

Pat down mixture to compact. Evenly distribute ½ cup semi sweet chocolate chips to create the base layer. Drizzle ¼ cup honey (tack) on top of the base. Spread 1 cup peanut butter (asphalt) to complete the road.

### Step 3: Enjoy Your Roads

Review all the layers that go into making a roadway then enjoy your tasty treat! (form into balls and throw in the freezer to enjoy in a couple hours)



# STEP 3

## Discovering Ajax Paving: A Leader in Road Construction & Community Support

Meet Ajax Paving, a company that plays a crucial role in creating and maintaining the roads that connect our communities. What started as a small asphalt paving company, Ajax quickly grew into a major player in the road construction industry.



### Ajax Paving Timeline

#### Today:

Ajax is the top asphalt producer in Florida

#### 2012:

Expanded into Largo, Florida

#### 1998:

Upgraded plant in Venice, Florida

#### 1981:

Expanded into Florida

#### 2019:

Newest plant in Lake Wales opens

#### 2007:

Awarded largest FDOT project

#### 1982:

Opened first asphalt plant in Placida, Florida

#### 1951:

Ajax founded by Herbert H. Jacob in Michigan

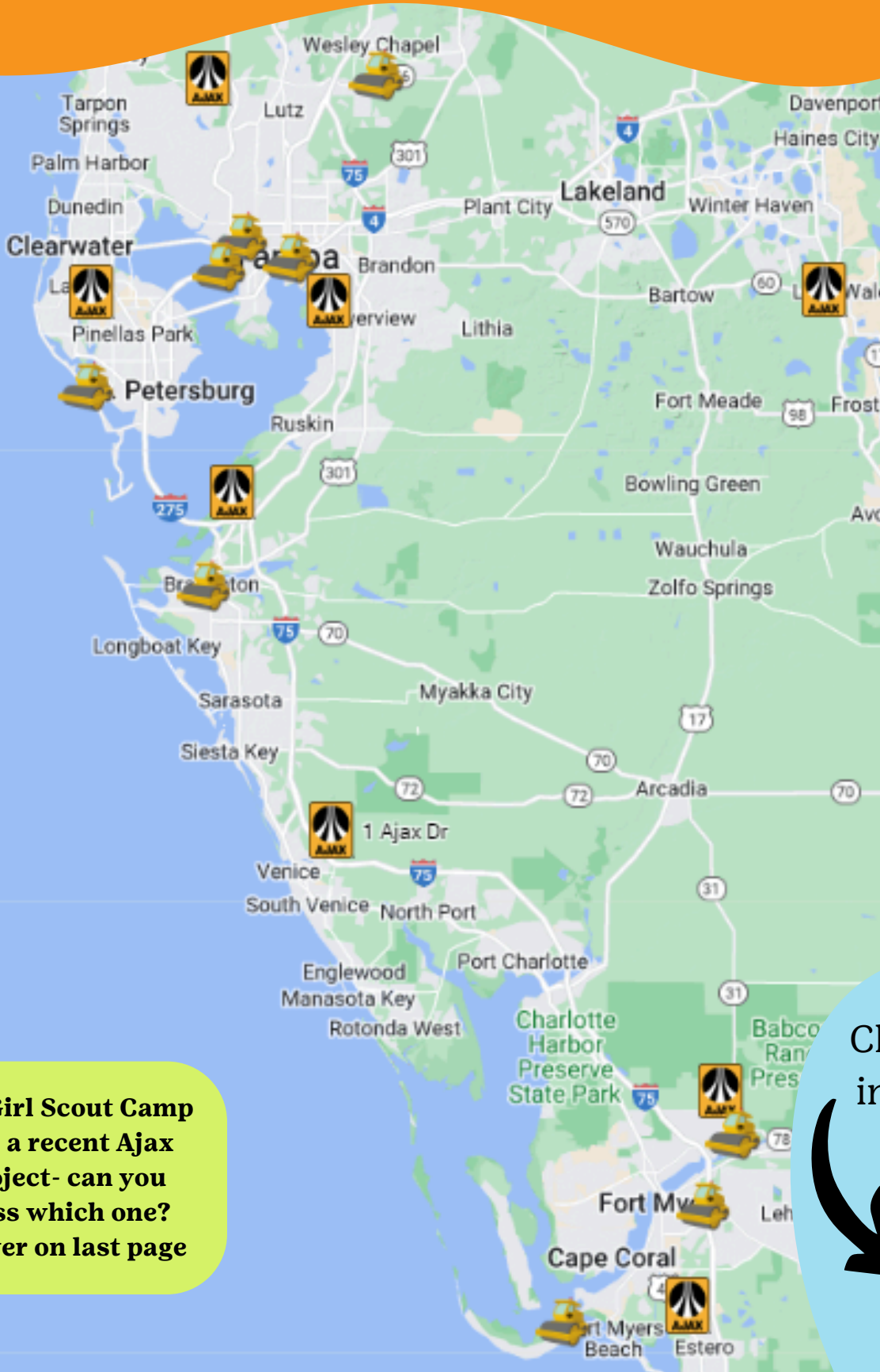
Ajax, in a joint venture with Anderson Columbia, was awarded the I-75 Mega Project, the largest highway project in Florida's history. This \$435 million project involved widening and improving 30 miles of I-75 in Collier and Lee Counties. The project required fast-tracked construction to be completed in three years instead of the initially envisioned eight years.

Check out Ajax Website here



# Recent AJAX Projects!

Chances are high that you have driven over an Ajax Project. They are everywhere, from I-75, US 301, I-275 that goes right through Tampa bay, downtown Tampa, and our Tampa international Airport.



Ajax Plant Locations



Ajax Projects

**Our Girl Scout Camp was a recent Ajax Project- can you guess which one? Answer on last page**

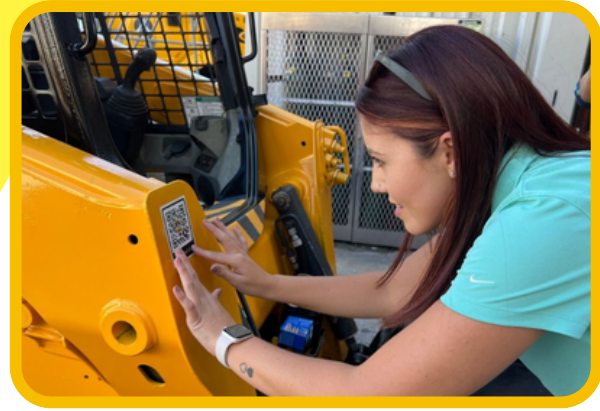
Check out Ajax's interactive map!





# STEP 4

## Explore Careers with Ajax



Adriana-Equipment Division Administrator

Curious about the different careers involved in building and maintaining our roads? Ajax employs women working in a variety of roles and environments, from engineers to project managers, to trucking and operations. Ajax's mission is to create an inclusive environment for the women of Ajax, providing support and developing leadership potential both within our ranks and when recruiting potential employees.

### Meet a:



Marketing Director  
Megan



Ida  
Engineer Intern



Safety Director  
Mandy



Service Truck Driver  
Sabra



Project Engineer  
Taylor





## CHOICE - Choose One:

Take a Tour:

You can take a virtual tour of an Ajax paving facility: See our links page!

Want to take a tour in person with your troop?  
Check out the GSWCF calendar for the next Ajax Plant Tour date.

# OR

Career Investigation:

From the creative problem-solving of engineers, to the logistical expertise of coordinators, Ajax has a wide range of careers that help support their operation.

Find those careers using the QR code to the right and mark which careers look the most interesting to you!

From those careers, try to learn more about what education they need, what they do daily and their role in road construction. Have a conversation with your friends, troop or family about what you learn.





# Thank you Ajax Paving!



In 2024, Ajax Paving donated their time and labor to help renew our GSWCF Camp Wai Lani Camp.

Scan here to fill out your patch request



To complete request, you will need:  
the number of patches requested and  
photos of your troops' Ajax activities.

## Key Links

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Road Safety: <https://www.youtube.com/watch?v=CZz1xg9vS78>

Recycling: <https://www.youtube.com/watch?v=XKFaC5RYbEM>

Road Layers: <https://www.youtube.com/watch?v=yBWP2QI4oaA>

Ajax Paving <https://www.ajaxpavingfl.com/who-we-are>

Timeline:

Career <https://www.youtube.com/watch?v=r3zTBonFEc4>

Exploration

Virtual Tour: <https://youtu.be/C1UYusqSlsY?si=OX3IjPdOorwfYjzO>

Patch Request: <https://gswcf.jotform.com/250824939189875>

**Keep exploring, stay curious, and continue to help us pave a better future for your community!**

# Key Words

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**Aggregates:** Materials like sand, gravel and crushed stone mixed with bitumen create asphalt.

**Asphalt:** A mixture of aggregates (like sand, gravel and crushed stone) and bitumen (a sticky substance derived from crude oil) used for paving roads

**Bitumen:** A sticky, black and highly viscous liquid or semi-solid form of petroleum used as a binding agent in asphalt.

**Civil Engineering:** A field of engineering focused on designing, constructing and maintaining infrastructure such as roads, bridges and water systems.

**Infrastructure:** The basic physical structures and facilities needed for a society to function, such as roads, bridges, water supply systems and power grids.

**Road Safety:** Measures and practices that ensure the safety of pedestrians, cyclists and drivers on roads. This includes using crosswalks, wearing helmets, following traffic laws and advocating for better road signs and signals.

**Sustainability:** Practices that focus on using eco-friendly materials, recycling and minimizing environmental impact in construction activities.

