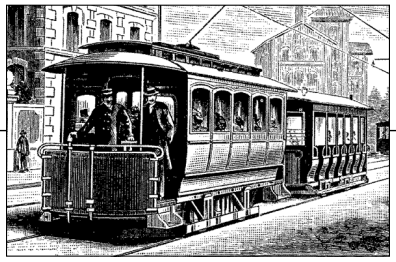
From carriages to commuter rail

Transportation & Public Transit

A **TransitPeople** Online Lesson for kids and teachers

Contents



TransitPeople
P.O. Box 811817
Los Angeles, California
90081-1817
Tel: 213.637.0409
E-mail: transit@transitpeople.org

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Chapter 1

Early Transportation

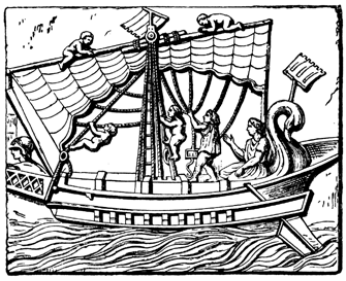
Today we take cars, trains, airplanes and power boats for granted. But we haven't always had them.

People have lived on earth for millions of years. But until a few hundred years ago, there weren't that many ways to get around... besides walking!

One of the most important inventions was the wheel. The wheel made it possible to move things by rolling, instead of carrying them or dragging them on the ground. The people of Mesopotamia first used wheels between 3500 and 3000 B.C.

Another important invention was the boat. Before the boat, people didn't really have any way of getting across big bodies of water, like lakes and oceans. Do you think Christopher Columbus would have come to America if he'd had to swim?

The first boats were just rafts. People made them by laying tree trunks or branches side by side and tying them together. Later on they covered the bottoms of the rafts with animal skins to try to keep the water out.



Around five thousand years ago, the Egyptians made the first sailboats. The sails catch the wind and use wind power to make the boat go. If there wasn't enough wind, the Egyptians had to paddle.

While the Egyptians made the first sailboats, some other people had found another way of getting around: they could ride horses!

The horses traveled a lot farther after the invention of horseshoes. Horseshoes are metal shoes nailed to the bottom of a horse's foot.

TRANSPORTATION FUN FACTS

Let's say you had to move a kid across the playground. Would you rather drag the kid on a sweater, or push the kid on a cart? The cart's rolling wheels reduce friction.

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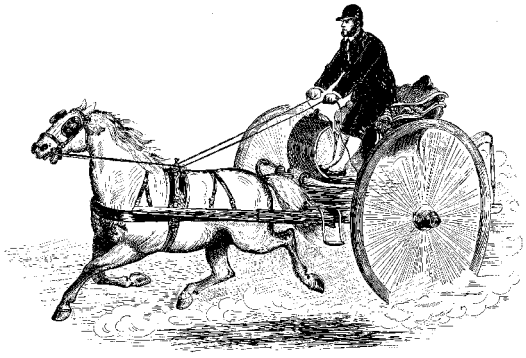
If you had to go up a steep, rocky hillside, could you climb it better barefoot or wearing shoes? Well, so could a horse! People built roads to ride their horses and roll their carts on. The Chinese had roads with speed limits three thousands years ago. Officials stood on the roads to decide who went first at crossings.

In Rome, writers complained about traffic jams thousands of years ago. There were too many carts and horses! No wonder; the Romans built fifty thousand miles of roads.

But horses, carts and sailboats didn't let people travel nearly as quickly as we can today. People lived close to their jobs, because they could only get to work by walking or riding a horse.

Then, in 1804, an inventor named Richard Trevithick made something very important.



Chapter 1: Early Transportation

Quiz

1. Between 3500 and 3500 B.C., wheels were used by the people of:

A: Barstow
B: Messy Potatoes
C: Sacramento
D: Mesopotamia

2. To keep water from seeping in, early boat builders sometimes covered the bottoms of rafts with:

A: Lunch tickets
B: Homework
C: Animal skins
D: Old sweaters

3. Who made the first sailboats?

A: Egyptians
B: Mesopotamians
C: Homer Simpson
D: Teddy Roosevelt

4. Horses were able to travel farther after the invention of:

A: Braces
B: Saddles
C: Horseshoes
D: Scooters

5. What did writers in Rome complain about thousands of years ago?

A: Mean teachers
B: Traffic jams
C: Homework
D: Slow buses

Circle the letter (**A, B, C, D**) next to the answer you think is the right answer.

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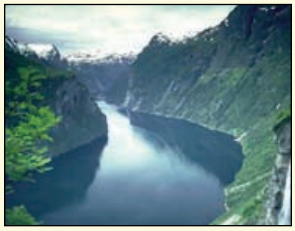
Think Sheet

Pretend that you had to live in one of these places in the photographs thousands of years ago, before there were cars, trains or roads. How would you get food and clothing? What if you got sick? Would some of these places be better to live in than others? Which would be the best to live in? Which would be the worst?



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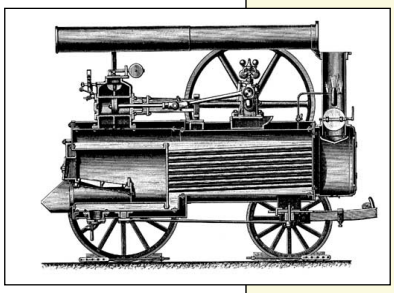
Chapter 2

The Train Era

Richard Trevithick built the very first locomotive. A locomotive is a vehicle with an engine that runs on railroad tracks. It pulls other vehicles behind it.

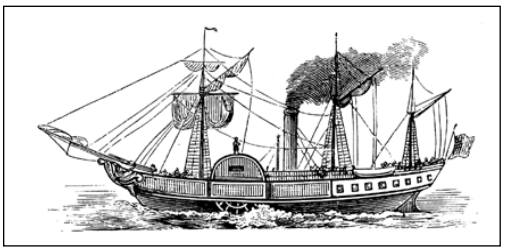
Trevithick's locomotive could pull seventy people along ten miles of railroad tracks. It was powered by a steam engine.

A steam engine runs on boiling water. A fire of coal or wood heats the water, and the boiling water makes steam. The force of the steam pushes a piston up and down. Gears change the motion of the piston into the round-and-round motion of the wheels on tracks.



People also put steam engines on boats. Some of the first steamships traveled the Mississippi River. Instead of turning wheels round and round, the engines turned giant paddlewheels, like the one on this boat. Later on steamships used propellers.

Not everyone liked the new ways of traveling. One scientist thought that high speed train travel could make the brains fall out. Some farmers didn't like trains because the noise and smoke scared cows and horses.



Still, lots of people wanted to use trains and steamships to go long distances. In 1840, an Englishman started the first steamship service across the Atlantic Ocean. Soon there were other services carrying mail, people and cargo across other oceans, too.

Railroads and steamships changed the way people lived. People could buy fresh milk and vegetables that the trains transported from faraway places. They could visit faraway places too, or live in the country and "commute" into the city by train. Steamships made it possible for millions of people to come to the United States from Europe.

TRANSPORTATION FUN FACTS

The first railroad line to carry people opened in 1825. After that railroad lines were built all over the world. The United States built a railroad that went all the way across the country, from New York to Sacramento.

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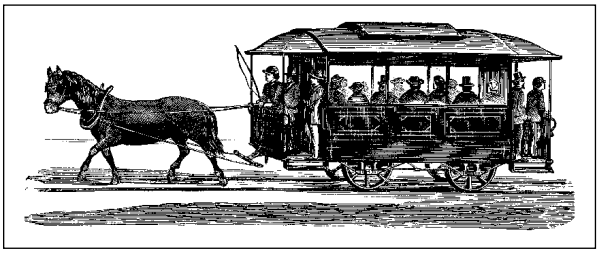
Trains also changed the way people traveled in cities.

Before trains, horses and mules pulled trolley cars on tracks. These didn't go very fast. Sometimes the horse pulled the car off the tracks by accident, and everyone had to get out and push the car back on again!

In the late 1800s, electric railways began to replace the horse trolleys. These were much faster. Now people could live much farther from where they worked, and commute by train.

Cities all over the world built public transit rail systems. London built the first underground system in 1863; it was followed by Budapest, and then by Boston and New York. In Los Angeles, a millionaire named Henry Huntington built the Pacfic Electric railway: the biggest public train electric railway system in the world.

Some of these systems were much bigger than the public transit systems these cities have today. The reason was simple:



it was the only way people had of going places quickly! Most people wanted to live near a transit stop. Business people made lots of money building transit systems to serve them.

But even as new trains were built and city engineers were laying down new miles of railroad track, a new machine was being created that would completely change the way people traveled all over again.

The car.

Chapter 2: The Train Era

Quiz

1. A locomotive is a vehicle that:

A: needs to calm down
B: people drove like cars
C: runs on railroad tracks
D: knows the times tables

2. Who built the first locomotive?

A: Richard Trevithick
B: Richard Simmons
C: Richard Pryor
D: Richard Nixon

3. The first locomotives were powered by:

A: their sense of smell
B: gasoline
C: love of travel
D: steam

4. Steam engines also were used to power:

A: sailboats
B: steamboats
C: very, very old cars
D: airplanes

5. The United States built a railroad that went from Sacramento to:

A: Emeryville
B: Barstow
C: New York
D: Ancient Rome

6. Before trains were invented, trolley cars were pulled by:

A: Richard Trevithick
B: horses and mules
C: lions and tigers
D: anyone who felt bored

7. Los Angeles' Pacific Electric Railway system was the biggest electric railway system:

A: built by Henry Huntington
B: in the world
C: in California
D: in this galaxy

Circle the letter (**A, B, C, D**) next to the answer you think is the right answer.

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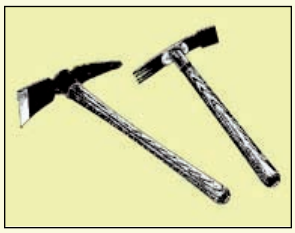
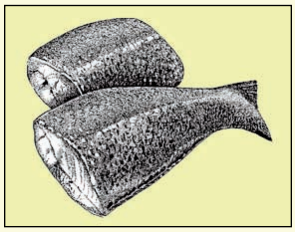
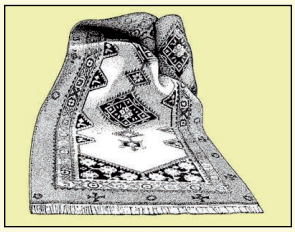
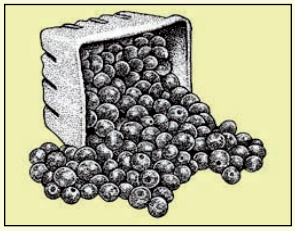
Think Sheet

How do you think the spread of the railroads affected the price people paid for these things? How did it affect the quality? Do you think the price and quality of some things was affected more than the price and quality of others? Why?









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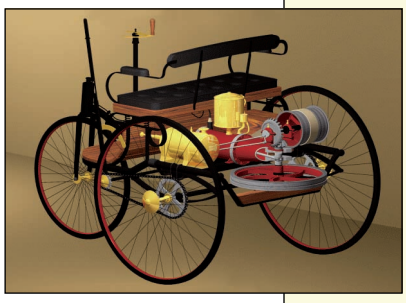
Chapter 3

The Car Era

In 1878, a German engineer named Nikolaus Otto built a new kind of engine. The internal combustion engine didn't need a separate, heavy boiler to burn fuel, as the steam engine did. It burned the fuel inside the engine itself.

Engineers could build internal combustion engines that were much lighter and smaller than steam engines. And inventors could fit the new engines to smaller vehicles ... like cars.



Benz built a factory to make cars that people could buy. So did other inventors. The early cars were expensive and very unreliable.

Later on, some companies used the internal combustion engine to make a vehicle for carrying lots of people: the bus. Others used it in planes.

In 1903, two bicycle shop owners named Wilbur and Orville Wright flew a plane they built on some sandhills in North Carolina. This was the first time a person flew a powered plane anywhere!

In 1908, an American inventor, Henry Ford, created a car he called the Model T. The Model T was more reliable and easier to drive than earlier cars. It was also a lot cheaper.

Suddenly, people who weren't rich could buy a car of their own. Henry Ford's factory built up to a thousand Model Ts a day. Cars became much more popular.

People went crazy over cars! In Los Angeles in 1920, people took nine electric trolley rides for every one ride they took in a car. By 1924, cars had gotten so popular that Angelenos took one trip in a car for every single trolley ride. Cadillac, Packard and other companies made expensive cars just for rich people, with leather upholstery and powerful engines. People

TRANSPORTATION FUN FACTS

In 1887, the inventor Karl Benz showed a vehicle using the new internal combustion engine in Germany. The "Motorwagen" could go eight miles an hour and seat two people. This was probably the first car.

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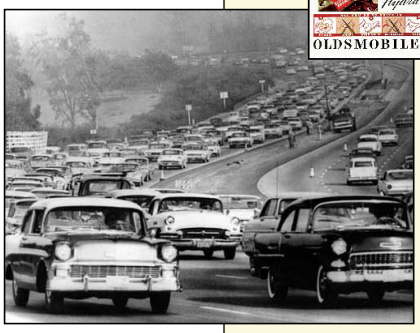
bought magazines just to look at pictures of cars, and raced cars on race tracks and on the street. Some people wouldn't be friendly with other people unless they liked the cars that they drove!

By the late 1930s, the government had started building special roads just for cars: freeways! Soon cities like Los Angeles had miles and miles of freeways. Cars could go faster than ever!

The popularity of cars changed the way new cities and towns were built. Planners didn't have to worry if homes were close to a bus or train stop. Most people didn't care anymore. The planners could make the new communities all spread out, with wide streets and few sidewalks. People wouldn't walk to the store or to work: they'd drive!



Meanwhile, the big public transit systems were having big problems. In the 1940s, almost 24 billion people a year took rides on trains and buses. By the middle 1960s, the number had dropped to 7 billion. People didn't want to ride trains or buses when they could afford a car.

Public transit systems started losing more and more money. In Los Angeles, the Pacific Electric railway shut down. Other transit operators cut services. Buses and trains weren't popular anymore. People liked cars better.

But then cars started causing big problems.

Chapter 3: The Car Era

Quiz

Circle the letter (**A, B, C, D**) next to the answer you think is the right answer.

1. **In 1878, Nikolaus Otto invented a new engine that could be made smaller and lighter than a steam engine. This engine was called the:**

   A: locomotive
   B: internal combustion engine
   C: combusted internal engine
   D: new and improved engine

2. **Otto's engine could be made smaller because it didn't burn fuel in a separate boiler. Instead it burned fuel:**

   A: before the engine started
   B: outdoors
   C: inside the engine itself
   D: somewhere kids can't go

3. **Who built the first car?**

   A: TransitPeople
   B: Richard Trevithick
   C: Karl Benz
   D: no one knows

4. **In 1908, Henry Ford built a new car that was cheaper and more reliable than older cars. He called his car the:**

   A: Model T
   B: cheap, reliable car
   C: Volkswagen
   D: Navigator

5. **One expensive car built for rich people was called the:**

   A: Model T Deluxe
   B: Gucci
   C: Bel Air
   D: Packard

6. **In the 1930s, the government began building special roads for cars. These were called:**

   A: "car only" roads
   B: freeways
   C: speedways
   D: racetracks

7. **As cars became more popular, fewer people used:**

   A: sidewalks
   B: steam
   C: soap and water
   D: public transit

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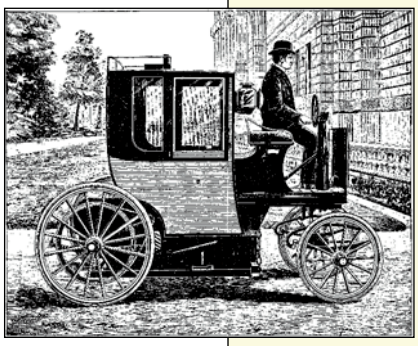
Think Sheet

Pretend that you just took your first ride in a car one hundred years ago. Write a letter about it to a friend. What was it like? Was the car comfortable? Did it break down? Would you want to buy a car like this for transportation, or would you prefer a horse?



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Chapter 4

Problems with Cars

People like cars for a lot of reasons. Car drivers don't need to wait for trains or buses to pick them up, or transfer to another car to get where they want to go.

It's easy for a car driver to stop at a market on the way home from work, or to pick up a kid like you after school. In some places, car drivers can travel two or three times as fast as people using trains and buses.

Car drivers can go visit their friends late at night without having to walk back to the bus stop when it's dark and scary outside. They don't need to wait for a ride in the rain, and they always get their own seat. Sometimes trains and buses get crowded. Car drivers never need to stand up while they're riding, and they don't need to sit next to anyone they don't like. (Except maybe their little brothers!)

And finally, there are lots of places you can go in a car that trains and buses don't go at all. If you have a car, you can live on a twisty little road that's way, way far away from everything else. The bus or train won't go there, because the bus or train doesn't make any money if only one person rides it. But you can go there in your car.

But the trouble is, the popularity of cars is the main reason they cause so much trouble: there are too many of them!

Air Pollution

One of the biggest problems cars cause is air pollution. An internal combustion engine uses fuel by mixing it with air and then burning it. When this happens, some exhaust gases are always left over. The exhaust gases go out the tailpipe and into the air. This isn't a problem if only a few people in a city drive cars; there's a lot of air! But what if millions of people are driving at the same time?

TRANSPORTATION FUN FACTS

Smog was so bad in Los Angeles, that the government began declaring "smog alerts." A "smog alert" happens when the air is too unhealthy to breathe. Sometimes kids were not even supposed to go outside to play.

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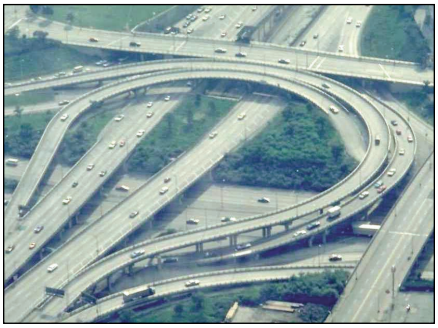
The answer is smog. Smog is what happens when the exhaust gases mix with sunlight. Sometimes you can see smog as a murky brown haze on the horizon. But smog is bad for you even if you can't see it.

Smog can make some people sick. Smog is especially bad for people who have problems with their lungs. Smog is one of the reasons that kids get asthma.

But more and more people drove, and the smog got worse and worse. Finally, the government passed laws that said that cars couldn't make as much pollution. The car makers put special controls on the new cars, so they wouldn't make as much smog. The oil companies changed the gasoline so it would burn more cleanly.

Today a new car makes much less pollution than an old car. You'd need more than ten new cars to make as much smog as one 1968 Chevelle. The air in Los Angeles and some other cities is much cleaner than it used to be.

In the 1970s, the government had to declare a smog alert in Los Angeles on almost every hot day. In 1998 there were only twelve smog alerts all year!



But smog is still a serious problem. It can hurt kids' lungs and cause heart attacks in adults. According to one study, the risk of cancer in Los Angeles is still hundreds of times higher than it would be if the air met government standards.

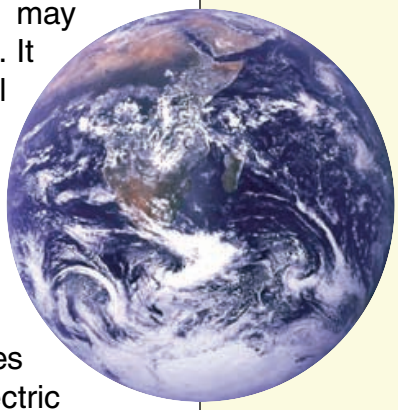
Global Warming

Another big problem partly caused by cars is global warming. The burning of fuel in all cars, even new ones that don't pollute very much, puts a gas called carbon dioxide in the air.

Carbon dioxide isn't pollution. Plants use it for photosynthesis. But the millions of cars, vans, trucks, motorcycles, buses, factories and powerplants running all over the world are making

much more carbon dioxide than would be in the air normally. The extra carbon dioxide helps trap the sun's heat on earth. The whole planet is heating up because of it.

A few scientists say that global warming isn't a big problem. But most think it's very serious. Global warming may cause shortages of food and water in some places. It may make the polar icecaps melt, and the sea level rise. One study said that average temperatures could be as much as eleven degrees higher by the end of the century. No one really knows how the world will change if people make it hotter.



Some new cars don't make any exhaust gases. These are electric cars. Electric cars have big batteries instead of engines. Have you ever recharged an electric toy by plugging it into a wall outlet? That's how electric cars are recharged!

Electric cars are a big improvement over regular cars! Unfortunately, they still make some pollution. The electricity to recharge them comes from powerplants. Powerplants are like factories that make energy for a whole city.

A few powerplants make energy from the wind or sun, but most don't. Most powerplants make energy by burning coal or oil... which makes more pollution!

The Union of Concerned Scientists wrote a book about how people can help the environment. They say that the most harmful activity is the use of cars and light trucks.

Traffic!

Cars use up a lot of space. In some cities, up to thirty percent of the land is taken up just by parking! Cars use freeways for fast driving, regular roads for slower driving, parking lots and parking garages and private garages built into homes. In an average city, every car has an average of eight parking spaces.

The next time you walk to school, look around your neighborhood at all the space cars use. I'll bet it's a lot!

One reason kids in some cities don't ride bikes very much is that there are so many cars. Parents worry that the cars will hit their kids.

Cars also get in traffic jams. A traffic jam is what happens when lots of drivers want to use the same road at the same time. There isn't enough room for them, so all the cars have to go very slowly.

Some people don't think that this is the cars' fault. They think it's the government's fault! They think the government should build more roads, so the cars would have room!

But researchers have found out that something funny happens when the government builds more roads: people drive on them! Whenever a new freeway opens or a popular road is widened, people usually take more trips and do more driving. And the extra trips and driving cause more traffic jams!

In a lot of places there just isn't any more room for new roads, even if the government wanted to build them. In Los Angeles, for instance, most of the freeways were built between 1950 and 1970, when four to six million people lived in the county. Now almost ten million people live there, and the freeways are crowded! But where in Los Angeles is there room for a new one?

Cars and Communities

Some people try to get away from traffic jams by moving to the suburbs. A suburb is a community that's close to a city, but not really part of it. Adults can go into the city to their jobs, but live in a place that feels like a small town. Suburbs start when the government gives permission for homes to be built on undeveloped land. Roads are put in, and water, sewage

and electric lines. Supermarkets and other businesses move in to sell things to the people who buy the new homes.

Some suburbs are really nice! A lot of times they're prettier, cleaner and quieter than most cities. And there's less traffic! For awhile.

But what happens when the new suburb is full? More homes and roads are built, and more people move in, and more stores open to sell them things. Now all the new people are driving on the brand new roads, and on the roads of the first suburb, and on the roads of the city that the suburbs are built around.

And then what happens if more homes, roads, people and stores move in after that?

This is called sprawl. Sprawl is one of the reasons there are so many traffic jams. Most of the new suburbs aren't built for public transportation. People who live there need cars to get around.

Just between 1975 and 1990, the total number of miles that Americans drove their vehicles increased by over fifty percent! What will happen if people keep driving more and more? The government says that traffic in Los Angeles will get twice as bad by 2015, if things don't change. But the city of Los Angeles alone already has more cars than the poorest sixty percent of the people in the entire world!

And what will happen when all the people in the poor countries can afford cars too? Right now only eight percent of the world's people own cars. Cars are used mostly in the richer countries. If there were 750 cars for every 1,000 people, as there are in the United States, there would be four and a half billion cars on the earth, all taking up space and making pollution. And the world's population is going to get a lot higher!

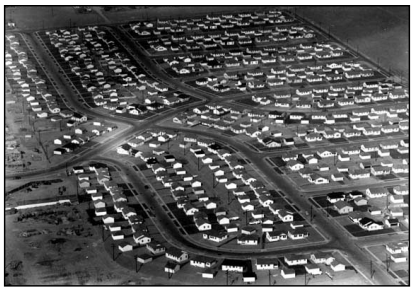
Can we Change?

There are other problems with cars. Some people can't see well enough to drive, or have other problems that prevent them

from driving. Some don't like cars because they cost lots of money. Cars are expensive to buy, and the owners need to pay for insurance and gas. When the cars break, the owners need to pay for repairs, too.

Recently, public transit has started to get more popular. More people are using it all over the country, especially in cities like New York.

Some people are very tired of air pollution, sprawl and traffic jams. Maybe more people are ready for a change.



Chapter 4: Problems with Cars

Quiz

1. Smog is what happens when exhaust gases mix with:

A: smoke and fog
B: sunlight
C: intake gases
D: Packards

2. A "smog alert" happens when the air is:

A: unhealthy to breathe
B: ugly to look at
C: really paying attention
D: eating all the smog

3. To make as much smog as one 1968 Chevelle, you'd need more than:

A: two new cars
B: five new cars
C: half of a 1968 Ranchero
D: ten new cars

4. Cars make this gas, which helps trap heat on earth and contributes to global warming:

A: H20
B: hidethylene polyexol
C: carbon dioxide
D: the fun gas

5. By the end of the century, global warming may cause average world temperatures to rise by as much as:

A: 11 degrees
B: 1 degree
C: height of Mount Everest
D: 6 degrees

6. The residents of Los Angeles own more cars than the poorest sixty percent of the people:

A: in the Andromeda galaxy
B: in seventh grade
C: in New York and Tokyo
D: on earth

7. In the United States, how many cars are there for every 1,000 people?

A: 750
B: 75
C: 2,000
D: just ten; the adults share

Circle the letter (**A, B, C, D**) next to the answer you think is the right answer.

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Think Sheet

If you were president, what would you do about environmental problems? Do you think that others would accept your solutions? Explain why you think that your ideas are best.

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Chapter 5

Public Transit

Getting people to use public transit is sometimes very difficult. One of the biggest problems is that transit companies can't afford to run buses or trains to places where not enough people will ride them.

This is a big problem in some of the communities built after the car became popular. A lot of these communities are spread out. People don't live in apartments or condominums clustered close to transit stops. Instead they live in houses a long way from bus or train lines.

A lot of people like to live this way. That's why they moved to the suburbs in the first place! But it makes it hard to design transit systems for them.

Public transit works best when the community is designed around it. This doesn't mean everyone has to be jammed together in dirty, crowded buildings. Many older communities are already designed for transit; they were built when streetcars were still popular!

The photo at left shows a "transit village" of homes and offices surrounding the BART train station in Pleasant Hill, California. The train station is the diagonal line in the middle of the picture.

Do you see how easy it is for the people who live and work here to take the train? Lots of them do; almost half of the people living near this station use BART to go to work!

A lot of communities also make it much easier to walk or ride bicycles. Using bicycles is very good for the environment! In Amsterdam, people can use special credit cards to check out "white bikes" from a computer-controlled bicycle rack. They can put the bikes back into another rack after they ride where they want to go.

TRANSPORTATION FUN FACTS

The Paris Metro, the Los Angeles Red Line and this train in Washington D.C. are subways. The longest subway in the world is in New York. It covers 722 miles and takes over 2.7 million New Yorkers to work every day.

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Of Ferries and Buses

There are many different kinds of public transit. One kind that nearly everyone uses is the airplane. Not very many people have planes of their own!

Boats can be used as public transit, too. In this picture, a ferry boat takes commuters to San Francisco. Customers can buy sandwiches and drinks, and eat them while they stand on the deck and look at the bay. But they have to be careful not to fall in the water!

Most of the time, though, public transit means traveling on land. One very popular form of public transit is the bus.

Buses are much cheaper than trains, and seat fewer people. They're best at serving transit routes that aren't heavily used. Some planners think that buses are almost always the best form of transit, because of the savings in money.

The city of Ottawa, Canada built a famous transit system using buses. Special busways run through the city. These are wide roads like freeways, but only buses can use them. More than 200,000 Ottawans ride the busways every day, and more than seventy percent of the trips downtown during the busiest hours are by public transit!

Trains!

There are different kinds of trains used in public transit. Light rail trains, or trolleys, usually run over ground. They run on electricity from power lines over the train tracks. They can go as fast as fifty-five miles an hour, although they usually go much slower in the city.

Light rail lines are more expensive than buses, but cheaper than heavy rail lines. The Blue and Green Line in Los Angeles are light rail lines. So are the Muni trains in San Francisco, the Portland MAX and the San Diego Trolley.

Some commuter trains run on electricity too. Others are powered by locomotives, just like the trains that transported people

and products around the country before cars were invented. The locomotive – the first car in the train – holds a giant diesel engine. The engine is much, much bigger and more powerful than the engine in any car. It makes 3,000 horsepower and can pull a nine hundred thousand pound train over one hundred miles per hour.

Commuter trains often run on the same train routes built over a hundred years ago. They're called commuter trains because they run most often in the morning and the afternoon, when people need to go to and from work.

Commuter trains often are nicer inside than most other types of trains. They sometimes have bathrooms, and big, comfortable chairs, and tables, so business people can do work while they're riding to the office.

Some communities grew up around commuter train routes nearly a hundred years ago, before hardly anyone was worried about the environment. Towns like Scarsdale and Bronxville in New York are good examples.

Heavy rail trains are also called subways, or metros. They usually run under the ground. Heavy rail trains go faster than light rail trains, and cost more to build. They get their power from a "third rail" next to the train tracks. This third rail is very dangerous!

Heavy rail can be one of the most nicest forms of public transit. The trains are fast. Automobiles don't get in the way of the heavy rail trains, if they run under ground, and they don't get in the way of the automobiles, either.

But heavy rail is expensive. Heavy rail systems make the most sense in places where lots and lots of people will

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ride them... like through the center of big cities. How many people do you think there are in this crowded subway station in Washington, D.C.?

Monorails are a special kind of train that run on just one track... a monorail! Monorails have never gotten very popular, although some people think they should be.

Other Trains

Not all passenger trains are built to carry people inside a city, or from a city to a suburb. Some passenger trains carry people much longer distances.

Amtrak is the name for the national railroad system. If you want to go from San Francisco to Los Angeles, but don't want to fly, you can take an Amtrak train.

Amtrak trains run all over the United States. They're nice inside, like commuter trains.

In Europe and Japan, some new, special trains have been built to carry people much faster than other trains can go. The French TGV draws electric power from an overhead wire, like a light rail train, but goes much faster: up to 186 miles an hour. One TGV went over three hundred miles an hour!

The Japanese "bullet train" got its name because of how fast it can go: like a bullet!

The MagLev is a new type of train. Powerful magnets on the track and on the bottom of the train keep the train floating about four inches over the track. It doesn't touch the track at all when it's running. MagLev trains can go over three hundred miles an hour.

Many people want to build fast trains like this in the United States, too.

Chapter 5: Public Transit

Quiz

Circle the letter (**A, B, C, D**) next to the answer you think is the right answer.

1. Public transit companies can't afford to operate trains or buses if:

A: they need money for stuff
A: the drivers feel bad
A: people don't use them
A: kids don't behave

2. Public transit works best when the community:

A: is designed for transit
B: is designed for cars
C: has wiiiiide roads
D: is designed for kids

3. How many of the people living near the BART station in Pleasant Hill use public transit to go to work?

A: lots of them
B: none; they fly to work
C: 63.7%
D: almost half

4. A "busway" in Ottawa is a road that can be used only by:

A: subways
B: teachers
C: commuters
D: buses

5. Fill in the blanks: ____ rail trains usually run over ground, and ____ rail trains usually run underground.

A: light, heavy
B: heavy, light
C: big, fat
D: ugly, smelly

6. Commuter trains run most often in the morning and afternoon, when riders are traveling:

A: to pick up their kids
B: to pick up their parents
C: to and from work
D: to the train station

7. How many New Yorkers ride the subway to work each day?

A: More than 200
B: 2.7 million
C: 63.7%
D: 5 gazillion

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Think Sheet

If you had to invent a brand new public transit vehicle, what would it be like? Would it run on land, water, or through the air, or all three? How many people would it seat, and how much would a ticket cost? Draw a picture of it here!

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Quiz Answers

Chapter 1

Q:	A:
1	D
2	C
3	A
4	C
5	B

Chapter 2

Q:	A:
1	C
2	A
3	D
4	B
5	C
6	B
7	B

Chapter 3

Q:	A:
1	B
2	C
3	C
4	A
5	D
6	B
7	D

Chapter 4

Q:	A:
1	B
2	A
3	D
4	C
5	A
6	D
7	A

Chapter 5

Q:	A:
1	C
2	A
3	D
4	D
5	A
6	C
7	B

Image Credits

1	Girl dragging boy	Anthony Vasquez
2	Children arguing	Anthony Vasquez
6	Smoking locomotive	Indiana Trans. Museum
10	1885 Benz	Steve Toeppe
10	Early Airplane	Los Angelez Public Library
11	Car advertisement	Ted's Vintage Ad Museum
11	Cars on freeway	Los Angeles Public Library
11	Public transit vehicle	Los Angeles Public Library
14	Boys in car	Anthony Vasquez
14	Women on smoggy day	Los Angeles Public Library
15	Boy with asthma inhaler	Anthony Vasquez
16	Arctic ice	Sheryl Schindler
17	Girl on bicycle	Anthony Vasquez
18	Kids on wagon	Anthony Vasquez
18	Happy boy	Anthony Vasquez
19	Sad boy	Anthony Vasquez
19	Housing development	Los Angeles Public Library
19	Sprawl	Los Angeles Public Library
20	Kids boarding bus	Anthony Vasquez
23	Subway	Washington D.C. M.A.T.A.
23	Aerial view	Bay Area Rapid Transit
24	Ferry	Golden Gate Transit
24	Bus	O.C. Transpo
25	Busway	O.C. Transpo
25	Kids next to train	Anthony Vasquez
25	Commuter train	Metrolink
26	Kids in train	Anthony Vasquez
26	Crowd boarding subway	Washington D.C. M.A.T.A.

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