Transportation Education Program

Teacher Handbook

New Jersey
Department of
Transportation

NJTRANSIT

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Table of Contents

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Introduction

1. Introduction

Introduction To The Instructor

Advances in human mobility and the movement of goods have had both positive and negative impacts on the development of society and the economy. As the world becomes more integrated and demands on transportation increase, it is important to critically evaluate the vital role transportation plays in our lives. As an instructor, you make it possible for future generations to participate in this evaluation.

This transportation education program offers an ideal opportunity for an interactive and dynamic dialogue among New Jersey's public school students regarding the interrelationship between transportation, those who use it, and their environment. Your students are the decision-makers and the commuters of tomorrow, and by learning to apply concepts and problem-solving skills, they will develop the ability to effect positive change in quality of life at both the community and state levels.

Adaptability

The following series of cross-curricular activities focuses on past, present, and future impacts of transportation on American society. These activities are intended to be an off-the-shelf resource and you are encouraged to experiment with them to discover what works best for your class. They are designed to enable your students to think critically about both the benefits and challenges posed by an increasingly complex and sophisticated transportation network, and are suggestions, the basis upon which to build a lesson. The concepts, not specifics, are important.

Although targeted for Grade 8, these activities can be scaled up or down in complexity to make them appropriate for other age groups. Suggestions about how this can be accomplished are provided in the activity procedures.

A successful pilot program was conducted at the Garrett Morgan Academy for Transportation & Technology in Paterson, NJ, during the Spring 2006 semester. Included in Chapter Three are a letter from Director Michael Gowdy and comments from students in the participating "Transportation and Society" class.

Availability

These exercises are meant to be freely accessible to all schools in New Jersey. Instructors will be able to download a copy of the entire set of units from both the NJDOT and New Jersey Department of Education (NJDOE) Web sites.

If you would like to learn more about the education program, or have any questions, you can contact NJDOT's Bureau of Statewide Planning at (609) 530-2884.

2

How To Use This Handbook

2. *How To Use This* Handbook

General Overview

Using the Table of Contents as a guide, you will find that Chapters One, Two, and Three offer informational and anecdotal introductions to this handbook. Chapters Four, Five, and Six contain units, while Chapters Seven and Eight are reference chapters, containing the Webography and Glossary.

Within each unit, there are sub-units called exercises, and within each exercise are activities. You will note icons throughout the exercises. Below is a list of what each icon represents.

Sections that are specifically for the instructor's use. They highlight such items as background information, class discussion guides, and examples of completed activities to serve as grading guides.

Sections that are specifically for the students' use. They highlight such items as assignment instructions and reference handouts.

Material that can be used interchangeably by the instructor and student, such as Web Resources.

Materials to be photocopied for distribution.

Optional handouts, such as Homework Extension handouts.

2. *How To Use This* Handbook

Exercise Format

Each exercise is presented in the following format:

Objective:
A brief overview of the activities and their objectives.

Materials:
A list of resources such as school libraries and computers that students will need to complete each activity. Also listed are the names of each activity handout with page references.

Procedures:
Detailed, step-by-step instructions to guide the teacher through each activity. Examples of activity tables and charts may be included, as well as the suggested duration of each activity.

Extensions:
Ways to scale some activities for higher and lower grade students. Brief overviews and procedures are listed.

Homework:
A summary of the homework assignments given in each activity.

Assessment:
Suggestions on how teachers can evaluate students during an activity. These are meant only as guidelines and seek to reinforce the skills and objectives of the exercise.

NJ Curriculum Standards:
The adopted New Jersey Core Curriculum Content Standards from the New Jersey Department of Education that cover each activity.

Handouts:
The actual discussion guide, assignment, and reference handouts.

Web Resources:
This is a list of all Web site resources suggested for activity research. The majority of the sites are from the United States government, national urban planning organizations, and museum exhibitions. Some sites fall under more general categories, but have been researched for authenticity. Students should be advised to use these resources as either primary research tools or as guides for further research. The links were all active as of August 29, 2006. If the links are no longer in use when these lessons are taught, students should be referred to web search engines to research via key words relevant to the exercise or activity.

3

Garrett Morgan Academy: The Pilot Program

3.1 Letter *From* Director Michael Gowdy

Garrett Morgan Academ

TRANSPORTATION & ENGINEERING

It appears that less and less emphasis is placed on meeting the increasing demands of improving transportation and infrastructure. Without immediate and bold action, we will continue to use non-economical modes of travel, congested roadways, corroded waterways, and deteriorating bridges. We must reevaluate the vital role transportation plays in our lives and examine how we can improve the system. It is even more important to equip our youth with the skills necessary to resolve these issues as well as empower them with the confidence to take action. Implementing The New Jersey Department of Transportation and NJ TRANSIT Educational Program provided Garrett Morgan Academy students with this opportunity.

We had the pleasure of participating in the pilot program during the 2005-06 school year. We successfully incorporated the units and lessons into a career-elective course for two marking periods. Although the program focused on transportation, each lesson contained interdisciplinary and user-friendly activities that addressed core curriculum content standards in math, science, social studies, language arts, career education, visual arts and/or health education. The program allowed our students to participate in cooperative learning activities that were relevant to their everyday experiences. They were also able to reflect on the ways transportation affected their lives as well as their ability to influence the impact transportation has on society and the environment.

My favorite part of the program was the culminating activity: Transportationville, USA. I was extremely impressed with the level of excitement and enthusiasm our students exhibited while roleplaying a community planning meeting. Watching our students present researched-based arguments and intelligently debate the issues was truly a powerful experience.

I strongly encourage any school or teacher that is looking for an interactive program to enhance their students' research, critical thinking, problem solving, and public speaking skills to consider The New Jersey Department of Transportation and NJ TRANSIT Educational Program.

Sincerely,

Michael Gowdy

Mr. Michael C. Gowdy, Administrator

3.2 Comments *From* GMA Students

As the Pilot Program at Garrett Morgan Academy came to an end, students were asked to be part of the evaluation process. They filled out forms and, among other questions, stated their feelings about which exercises interested them the most and what they most learned about local and statewide transportation. This provided valuable insight for the further development of the program. Below are some of their comments.

"I think that this program is great for students and it should be taught to students all over New Jersey and the country."

"I think that these activities are a great opportunity for students to understand the pros and cons of transportation."

"I have learned about transportation that I've never heard of."

"[I learned] how transportation affects our everyday lives, from going to work to coming to school. I really understood how the Department of Transportation really does work on fixing transportation problems."

"I actually liked the 'Travel Journal' [activity] we completed. I liked this activity because it helped me keep track of everywhere I went."

"[The 'Spread the Word' activity] was interesting, as I see how different it was to travel in the old times with transportation restrictions."

"The ['Your Own Vision' activity] interested me because the children of today are going to make the difference of what the world will look like in the future. It gave me a chance to expand my mind and thought process in thinking of a new form of transportation that would well benefit us in the future."

"I liked the idea of [the 'Transportationville, USA' activity]. In the days we've been working on it, I have learned new vocabulary and some transportation terminology. The idea of a mock debate made it worthwhile working."

"Out of all the activities, I liked 'New [Advances in] Transportation'. This caught my attention because it was fun and it allowed us to use our own imagination."

4

Unit 1

The History of Transportation

4.1 *How* and *Where* Do You Travel?

Everyone travels

Whether it's to school or work, the mall or the library, young adults make multiple trips each day, using multiple modes. But just how many trips do we take? How many modes do we use? This exercise will help students find out.

Objective

In this exercise, students keep a Travel Journal to develop a sense of how far they travel and the various modes of transportation on which they depend. Analysis of the students' travel behavior can show how they compare to the average American, how much time is consumed traveling, and their personal impact on the environment.

Materials

- Computers with spreadsheet software
- Travel Journal Discussion Guide (Page 17)
- Travel Journal homework handout (Page 18)
- 15 blank Travel Journal pages (Page 19)
- Travel Journal Analysis handout (Page 20)
- Trip Planning handout (Page 21)
- Homework Extension handout (Page 22)

Procedure

Distribute copies of the attached blank Travel Journal. Students will probably need fifteen copies each for the activity, although they can also create their own journals. The students should fill in all of the information for every trip they take over the following two weeks. They should note the date, origin, destination, what mode of transportation they used, how far they traveled, how long each trip took, and how many people used the same mode. An example is given below. Students should list only trips with discrete origins and destinations. Driving to the mall counts as a trip, but walking between stores in the mall does not. Similarly, traveling to or from school counts as a trip, but walking between classes does not. If different modes are used in a single trip, that should be noted as well.

Date	Origin	Destination	Mode	Distance in miles	Time in minutes	Number of people
Sept 1	Home	School	Bus	5	25	30
Sept 1	School	McDonalds	Foot	.1	5	1
Sept 1	McDonalds	School	Foot	.1	5	1
Sept 1	School	Home	Car	5	10	2
Sept 1	Home	Blockbuster	Car	6	15	2
Sept 1	Blockbuster	Supermarket	Car	3	10	2
Sept 1	Supermarket	Home	Car	7	17	2
Sept 1	Home	Ashley's House	Car	3	12	2
Sept 1	Ashley's House	7-11	Car	5	10	2
Sept 1	7-11	CVS	Car	.1	2	2

4.1 *How* and *Where* Do You Travel?

If students do not have access to spreadsheet software at home, allow them class time to use the school's computer lab to enter their Travel Journals into a spreadsheet program. MapQuest, Google Maps, or other online mapping resources can be used to determine distances.

At the end of the Travel Journal period, students should analyze their travel behavior and fill out the attached Travel Journal Analysis handout.

After completing the Travel Journal Analysis handout, students will work individually on the Trip Planning activity. They will ask one family member for two pieces of information: the address of his or her place of work and the mode of transportation used. Students will not ask for specifics in the route taken. Then, depending on the mode used, students will visit NJ TRANSIT's Web site (found in the Web Resources) or a mapping Web site (examples also found in the Web Resources), and find a commuting route from home to work. They will then present this suggested route to their family member and ask whether it differs from the actual commute, and why or why not. Afterwards, they will again find a route from home to work, but using the alternative mode of transportation (i.e., if the family member travels by car, students will plan a new commute using only public transportation). Students will then ask their family member if he or she would consider taking the new suggested route, and why or why not. All findings will be discussed in class.

Using the attached class discussion guide, students should talk about what they learned from the exercise. This may also be used as a homework activity.

Duration

Two weeks or longer for Travel Journal. One night for Trip Planning activity. One class period for discussion.

Extensions

Environmental Impact Activity

Assign students to do out-of-class research at the school's library or media center on the impact of vehicle emissions on the environment.

Discuss the findings in class. Students should pay particular attention to how and what kind of emissions a car produces per minute of travel.

After the class discussion, have students analyze their travel behavior again to determine the amount of emissions their travel produces, and to find ways to reduce the environmental impact of their travel. Students should look at the trips they recorded in their Travel Journal and find ways to alter their travel patterns to reduce emissions while still doing the same activities. Students should be given no suggestions on how to do this, but be allowed to come up with their own solutions. These might include: walking or bicycling for shorter trips, carpooling, using public transit, combining trips, or driving in hybrid vehicles.

If time permits, a possible extension of this activity would be to have students keep a Travel Journal for another two weeks to see if they can actively reduce the amount of vehicle emissions produced.

The class will then discuss, as a whole, the solutions students found to reduce their vehicle emissions and how successful they were.

4.1 *How* and *Where* Do You Travel?

Changes In Travel Patterns Activity

Have students interview their parents, grandparents, aunts, and uncles about their travel behavior when they were growing up. Students should share their Travel Journal and find out how people in previous generations traveled. What new kinds of trips are made today that were not made thirty years ago (i.e., Blockbuster)? What kinds of trips are no longer made today? Do you see any difference in how previous generations traveled?

Have students write a brief paper on how their travel behavior differs from that of previous generations.

Homework

Daily Travel Journals and weekly analysis.

Suggested Assessment

(at instructor's discretion)

- Completeness of Travel Journals (30%)
- Quality of Travel Journal analysis (40%)
- Class participation (30%)

4.1 *How* and *Where* Do You Travel?

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Comprehensive Health and Physical Education

- 2.1 A 2, 3
- 2.2 A 1,2
- 2.2 B 1, 2, 3
- 2.5 A 4

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 13, 14
- 3.2 A 3, 4, 6
- 3.2 C
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C
- 3.4 A, B

Mathematics

- 4.1 A 3, 5
- 4.1 B 1, 4
- 4.1 C 2, 3
- 4.2 D
- 4.3
- 4.4
- 4.5

Science

- 5.5

Social Studies

- 6.2
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

4.1 *How* and *Where* Do You Travel?

Travel Journal Discussion Guide

Use the following questions to guide a class discussion or as a homework activity about the students' Travel Journals.

- What did you learn from keeping the journal?
- What, if anything, surprised you?
- What was the most heavily used form of transportation? What was the least?
- Why do you think some types of transportation are used more than others?
- Comparing your travel behavior with that of the average U.S. citizen, what similarities and differences do you see?
- How do you think travel behavior and patterns have changed over the years?
- What are some of the impacts of your travel behavior on the environment?

4.1 *How* and *Where* Do You Travel?

Homework Handout

Travel Journal

For the next two weeks, using the attached sheet, you're going to track your travels.

For each trip, note the:

- Date
- Origin
- Destination
- Mode of transportation used
- Distance traveled
- Length of time for trip to be completed
- Number of people using the same mode

See the example below

Web Resources

Directions and maps for travel

Google Maps
http://maps.google.com

Mapquest
http://www.mapquest.com/

Date	Origin	Destination	Mode	Distance in miles	Time in minutes	Number of people
Sept 1	Home	School	Bus	5	25	30
Sept 1	School	McDonalds	Foot	.1	5	1
Sept 1	McDonalds	School	Foot	.1	5	1
Sept 1	School	Home	Car	5	10	2
Sept 1	Home	Blockbuster	Car	6	15	2
Sept 1	Blockbuster	Supermarket	Car	3	10	2
Sept 1	Supermarket	Home	Car	7	17	2
Sept 1	Home	Ashley's house	Car	3	12	2
Sept 1	Ashley's house	7-11	Car	5	10	2
Sept 1	7-11	CVS	Car	.1	2	2
Sept 1	CVS	Home	Car	8	15	2
Sept 2	Home	Pavonia/Newport (Jersey City)	Multiple			
			Car	2	10	2
			Train	20	45	~800
			Subway	1	20	1000
Sept 2	Pavonia/Newport (Jersey City)	Home	Subway	1	20	1000
			Train	20	45	~800
			Car	2	10	2

4.1 *How* and *Where* Do You Travel?

Travel Journal

Date	Origin	Destination	Mode	Distance in miles	Time in minutes	Number of people

4.1 *How* and *Where* Do You Travel?

Travel Journal Analysis

Please calculate the following:

Total distance traveled: _____

Total time spent traveling: _____

Total distance traveled in a passenger car: _____

Modes of travel and number of times used

Mode _____ Times used _____

Mode _____ Times used _____

Mode _____ Times used _____

Mode _____ Times used _____

Average speed per mode

Mode _____ Average speed _____

Mode _____ Average speed _____

Mode _____ Average speed _____

Mode _____ Average speed _____

Average number of occupants per mode

Mode _____ Average occupants _____

Mode _____ Average occupants _____

Mode _____ Average occupants _____

Mode _____ Average occupants _____

4.1 *How* and *Where* Do You Travel?

Homework Handout

Trip Planning

The goal of this activity is to see how many different travel options are available to commuters in New Jersey.

First, choose a member of your family who commutes to work, and ask the following questions, recording your answers. To properly complete this assignment, **do not ask for specific directions, including names or numbers of roads, buses, or trains taken**.

- What is the address of your place of work?
- What mode of transportation do you use (i.e., car, train, bus, etc.?)

After answering these questions, go on the internet and find a route from your home to the work address given. If your family member takes a car to work, visit a mapping Web site (examples found in the Web Resources). If your family member takes public transportation to work, visit the NJ TRANSIT Web site (also found in the Web Resources).

Record your findings and show them to your family member. Ask the following questions and record your answers:

- Is this the route you take to work? If yes, why?
- If not, what route do you take and why?
- Would you consider this alternative route? Why or why not?

After answering these questions, search the internet again for a route using the alternative mode of transportation. Record your findings and show them to your family member. Ask the following question and record your answer:

- Would you consider this alternate route? Why or why not?

Web Resources

Mapquest
http://www.mapquest.com/

Google Maps
http://maps.google.com

NJ TRANSIT
Web site for New Jersey's public transportation corporation.
http://www.njtransit.com

4.1 *How* and *Where* Do You Travel?

Homework Extension Handout

Environmental Impact Activity

In the previous activity, you've seen how often you travel daily, and the kinds of transportation you use. Using your data and the Web Resources below, research the effects vehicle emissions from your travels are having on the environment. Your findings will be discussed in class. Pay particular attention to how and what kind of emissions a car produces per minute of travel. Once you've discovered the effects, come up with ways you can reduce the environmental impacts. How could you alter your travel pattern?

Web Resources

Environmental Protection Agency
"How Ground-level Ozone Affects the Way We Live & Breathe"
http://www.epa.gov/air/urbanair/ozone/

It All Adds Up To Cleaner Air
http://www.italladdsup.gov

Changes in Travel Patterns Activity

You now know how your travel patterns affect the environment, and ways you could change them. But what about when your parents, grandparents, and other family members were your age? Share your Travel Journal with them and compare your results to what their results might have been.

What new kinds of trips are made today that were not made thirty years ago (i.e., Blockbuster)? What kinds of trips are no longer made today? Do you see any difference in how previous generations traveled?

Using the Web Resources below and your family research, write a brief paper on how your travel behavior differs from that of previous generations.

Web Resources

2001 National Household Travel Survey
"Summary of Travel Trends"
http://nhts.ornl.gov/2001/pub/STT.pdf

American Public Transportation Association
"Milestones in U.S. Public Transportation History"
http://www.apta.com/research/stats/history/mileston.cfm

Smithsonian Institute
"America on the Move"
A resource for transportation history
http://americanhistory.si.edu/onthemove/

"Learning Resources"
http://americanhistory.si.edu/onthemove/learning/

4.2 Spread *the* Word

The previous exercise showed you how to track your current travels. In this exercise, you will plot your journey from another part of the country back to your home in Hoboken, New Jersey. The only catch? You're living in another century! How will you get home? What is available to you?

Objective

Working individually or in groups, students will pretend they are witnesses to some of the most important events in U.S. history. They know that what they are seeing and hearing will change this country forever…and they have to get back home to Hoboken, New Jersey immediately to tell their best friend **in person**! This exercise will use students' knowledge of U.S. history and transportation, and will require some math and logic skills. Students must find out when and where an event occurred and figure out how they will get home and how long the trip will take.

Materials

- Computer with internet access for research outside of class
- History books
- Encyclopedias
- Historical atlases
- School Media Center or Library
- Spread the Word Discussion Guide (Page 26)
- Spread the Word homework handout (Page 27)
- Homework Extension handout (Page 28)

Procedure

Distribute the Spread the Word homework handout to students and have them choose an event about which to write. Try to ensure equal distribution of events among the students. At the instructor's discretion, students can work individually or in groups to complete the assignment.

Suggest that students review the NJDOT "Publications" web page (found in the Web Resources) as part of their research, especially the documents "People: The Transportation Connection" and "A Special Look at New Jersey's Transportation System." These documents can provide a starting point for further research about the history of New Jersey's bridges, roads, and public transportation.

Below are some suggested events that are listed on the handout. Instructors may choose other historical events should they better complement the students' curriculum.

Suggested Events

- American patriots dump 342 chests of tea into the Harbor in protest of the Tea Act.
- The first passenger train arrives in Sacramento, CA over the transcontinental railroad.
- Gadget is detonated in the first test of a nuclear weapon.
- The first Ford Model T rolls off the assembly line.
- Lewis and Clark return from their expedition to the Pacific Ocean.

Example Suggested Events – Details:

American patriots dump 342 chests of tea into the Harbor in protest of the Tea Act.
Location: Boston, MA
Date: December 16, 1773
Mode: Stagecoach to New York, boat to Hoboken
Route: Boston Post Road
Distance: 250 miles
Speed: approximately 3 MPH

4.2 Spread *the* Word

Travel time: 5 to 6 days
Cost: extra credit if students can find this!
Challenges: bandits, river crossings

The first passenger train arrives in Sacramento, CA over the transcontinental railroad.
Location: Sacramento, CA
Date: May 19, 1869
Mode: Train
Route: Sacramento to Hoboken via Omaha
Distance: ~3200 miles
Speed: approximately 23 MPH
Travel time: ~5 to 6 days
Cost: ~$150 first class ($2105 today)
Challenges: washed-out rails, train robbers, accidents

Set aside some in-class time to brainstorm about how and where students can find answers to these questions. Encourage students to talk with the school's media specialist and local librarian. Students may have to consult a variety of resources to find the answers to all of the questions. Some suggestions include historical books on:

- life in colonial America
- pre-revolutionary travel
- exploration of the western United States
- immigration in the early 20th century
- the California Gold Rush
- American industrial revolution
- building of the transcontinental railroad
- history of World War II

Instructors may give students one week to complete the assignment, and then discuss their papers in class. Use the attached discussion guide to lead the discussion.

Duration

One week, which includes two in-class sessions and outside research. This is flexible and at the instructor's discretion.

Extensions

Letters and Diary Entries Activity

Rather than have the students write a traditional essay, writing a letter home or a diary entry detailing the trip could make this a more creative assignment.

Activity for Higher Grade Levels

Have students answer the same questions as if the event happened today. Have the students explain the different transportation choices that are available today as well as the preferred mode of travel now, compared to the preferred mode of travel in the past, and why.

Activity for Lower Grade Levels

Have students investigate only the historical event and try to determine what modes of travel were available to average citizens at the time.

Homework

Written paper on a historical event. Class time can be devoted to doing research and sharing resources found.

Suggested Assessment

(at instructor's discretion)

- Written assignment: quality, completeness, and application of logic (75%)
- Class participation (25%)

4.2 Spread *the* Word

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 13, 14
- 3.1 H 1, 4, 5
- 3.2 A 1, 2, 4, 6
- 3.2 B 1, 3, 4
- 3.2 C
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C
- 3.4 A, B

Mathematics

- 4.4
- 4.5

Social Studies

- 6.2
- 6.3
- 6.4
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

4.2 Spread *the* Word

Spread the Word - Discussion Guide

For each historical event, have a brief class discussion. The instructor can list each student's responses on the board and discuss which answers seem most appropriate and why. The intention here is to have students think critically about their answers and try to discover things they may have overlooked.

Have one student describe the event and why it was significant in U.S. or world history.

List responses to the following questions on the board:

- When did it occur?
- Where did it occur?
- What means of travel were available?
- How did you make the trip?
- How much did it cost?
- Did you travel alone?
- What route did you take?
- What challenges or obstacles did you encounter along the way?
- How long did the journey take?
- How would you make the same trip today and how long would it take?

As a class, have the students discuss what they found interesting, how transportation has changed, and what opportunities have been created by those changes. What are some of the implications of faster transportation? Ask students where they went on their last vacation (if appropriate) and if it would have been possible one hundred or even fifty years ago.

4.2 Spread *the* Word

Homework Handout

Spread the Word

You have just witnessed one of the most important events in U.S. or world history. You know that what you have seen will have a profound impact on your life as well as those of everyone you know. Your best friend is back home in Hoboken, New Jersey, and you have to get there immediately to tell him or her **in person**! Your assignment is to pick one of the following events and answer the questions below about how you would travel home immediately following the event. Use the Web Resources, especially the documents "People: The Transportation Connection" and "A Special Look at New Jersey's Transportation System" on the NJDOT "Publications" web page, as a starting point for research.

Events (pick one):

- American patriots dump 342 chests of tea into the Harbor in protest of the Tea Act.
- The first passenger train arrives in Sacramento, CA over the transcontinental railroad.
- Gadget is detonated in the first test of a nuclear weapon.
- The first Ford Model T rolls off the assembly line.
- Lewis and Clark return from their expedition to the Pacific Ocean.

For this assignment you will need to answer the following questions:

- Where and when did the event occur? Briefly describe what happened.
- How would you travel back home (by foot, horse, boat, car, train, plane, etc.)? Think about what means of travel were available and list all of them.
- How much would the trip cost on each available mode? Who could afford such a trip?
- Consider yourself to be the average American at the time. How would you make the trip? What options do you have? Are there alternative ways you can travel? Would you travel alone?
- What route would you take? Many of our roads are recent creations, but some have been around for a very long time (albeit in a much different condition). You must find out what travel routes had been established by the time the event occurs.
- What are some of the challenges you encounter along the way? Safe, reliable, and comfortable travel is a relatively new development. Try to experience the trip in your mind and describe it.
- How long would it take to make the journey and what month, day, and year do you arrive home? Remember you will need to eat and sleep.
- How would you make the same trip today? Try to answer the same questions as though the event happened today.

4.2 Spread *the* Word

Homework Extension Handout

Higher Grade Levels

Using the event you chose, answer the same questions from your Spread the Word homework handout as though the event happened today. Explain the different transportation choices that are available today. What is the preferred mode of travel now, as opposed to back then? Why do you think this change has occurred?

Lower Grade Levels

Using the list below, pick one of the historical events. How could the people of that time period travel? Describe what was available to them.

Events (pick one):

- American patriots dump 342 chests of tea into the Harbor in protest of the Tea Act.
- The first passenger train arrives in Sacramento, CA over the transcontinental railroad.
- Gadget is detonated in the first test of a nuclear weapon.
- The first Ford Model T rolls off the assembly line.
- Lewis and Clark return from their expedition to the Pacific Ocean.

4.2 Spread *the* Word

Web Resources

American Public Transportation Association
"Milestones in U.S. Public Transportation History"
http://www.apta.com/research/stats/history/mileston.cfm

EH.net
"What Is Its Relative Value in U.S. Dollars?"
http://eh.net/hmit/compare/

Google Maps
http://maps.google.com

infoplease.com
http://www.infoplease.com

Mapquest
http://www.mapquest.com/

New Jersey Department of Transportation
"Publications"
http://www.nj.gov/transportation/publicat/

Smithsonian Institute
"America on the Move"
A resource for transportation history
http://americanhistory.si.edu/onthemove/

"Learning Resources"
http://americanhistory.si.edu/onthemove/learning/

4.3 Where *Are We* Going?

Flying cars! Subways propelled by compressed air! As farfetched as these inventions sound, to many people they were once the future of transportation, while the airplane and automobile – now second nature to us – once seemed unthinkable, if not impossible. This exercise takes students on a trip through the past, present, and various futures of transportation history.

Objective

This four-part exercise will allow students to synthesize what they have learned about the history of transportation. Students will think about the limitations of our current transportation system, how they could be overcome, and what transportation might look like in the future. Students will also be able to question what future changes will mean for where we live, what we do, and where we go.

The first activity, Visions of the Future, will have students research past visions of transportation that are at least twenty years old (preferably older) and provide a description of what those visions predicted for the future. Discussion will center on what proved accurate and what did not. The second activity, The Past Meets the Future, will provide an opportunity for students to investigate actual advances in transportation and develop their own ideas of what transportation will be like in the future. The third activity, New Advances in Transportation, will have students research and write about new transportation technologies that are currently being developed, while the final part of this exercise, Your Own Vision, will have students develop a concept for a new type of transportation and create a presentation to pitch their ideas.

Materials

- Computer with internet access for research
- History books
- Encyclopedias
- School Media Center/Library
- Visions of the Future Discussion Guide (Page 34)
- Visions of the Future homework handout (Page 35)
- The Past Meets the Future Discussion Guide (Page 36)
- The Past Meets the Future homework handout (Page 37)
- New Advances in Transportation homework handout (Page 37)
- Your Own Vision homework handout (Page 38)

Procedure

Visions of the Future Activity

Have students research visions of transportation that are at least twenty years old and that provided a description of what transportation would look like in the future. Visions can be found in magazines, newspapers, books, movies, TV shows, lyrics, exhibitions, etc., and students can use the Web Resources for information and research as well. The only requirement is that the envisioned future must make reference to transportation and be for around the year 2000.

4.3 Where *Are We* Going?

Visions of the Future Activity continued

Distribute the attached discussion guide so students can prepare for an in-class discussion. Give students several days to complete the assignment and have them make notes about what they will discuss in class.

Set aside one class period to discuss the students' findings, and use the attached discussion guide to lead the conversation.

Duration

1-2 days

Homework

Find a vision of what transportation was supposed to look like in the future. Notes for an in-class discussion.

Suggested Assessment

(at instructor's discretion)

- Find an appropriate vision of the future (40%)
- Participation in class discussion (60%)

The Past Meets the Future Activity

Split the students into groups and assign them one of the following time periods:

- 1850 – 1880
- 1880 – 1920
- 1920 – 1960
- 1960 – 2000

Using the school library and Web Resources, especially the documents "People: The Transportation Connection" and "A Special Look at New Jersey's Transportation System" on the NJDOT "Publications" web page, have each group do in-depth research on the types of transportation available during that time period and what advances were made. At a minimum, students must discuss what new modes of transportation became available for the majority of the population.

To begin the class discussion, have each group explain the major advances that happened during their assigned time period. Use the attached guide to shift to a more general discussion. Based on these advances, emphasis should be on having students think about transportation of the future and to envision what it will look like. All visions and ideas should be encouraged, but the students should think about how transportation has already developed and what is most likely to happen in the future.

Duration

1-2 days

Homework

Group research on transportation developments in specific time periods.

Suggested Assessment

(at instructor's discretion)

- Notes from group research (40%)
- Class participation (60%)

New Advances in Transportation Activity

In this activity, students will have the opportunity to research new advances in transportation technology. Distribute the homework handout. Either have students choose their own topic or assign them one. Students can work individually or in groups to write a paper (length to be determined by the instructor) that answers the questions on the homework handout.

4.3 Where *Are We* Going?

The list of topics presented below is not exhaustive, and the instructor and students should brainstorm about other possible topics.

Research topics: (pick one)

- Sub-orbital flight
- Maglev trains
- Automated guideways
- Personal Rapid Transit
- Segway
- Intelligent Transportation Systems (ITS)
- Alternative fuels (including Cold Fusion)
- On-demand delivery systems
- Telecommunication advances

After the students have written their papers, they should be prepared to give a five to ten-minute presentation covering the major points of their research. Emphasis should be on the implications for transportation and society.

Duration

2-3 days

Homework

Research on new transportation technology. Written paper and presentation about the technology.

Suggested Assessment
(at instructor's discretion)

- Written paper (40%)
- Presentation (40%)
- Class participation (20%)

Your Own Vision Activity

Incorporating what they have learned in previous parts of this exercise, students will have the opportunity to invent a new type of transportation. Working in groups, students will create a completely new technology, a new application of current technology, or a radical modification of existing technology.

Students should be encouraged to be creative and imaginative, but to follow these rules:

1. What is proposed must be something that is not currently in use.
2. What is proposed must satisfy some current transportation need or deficiency.

Students will develop a presentation along with a written paper that answers the questions on the attached homework handout. For the presentation, students will play the part of an inventor proposing his or her invention to a group of investors (the rest of the class). The purpose of the presentation is to convince the investors to financially support the proposal. Presenters must convince their classmates that their idea will have a profound and positive impact on society and the economy. Presentations should include pictures, diagrams, maps, and any other device that would be useful to explain the necessity for the invention or innovation. The investors are responsible for deciding whether or not to support the invention or innovation and should ask the presenters questions about their proposals. The investors will then vote, based on the presentation and answers to questions, whether or not to support the proposal.

Duration

2-3 nights

Homework

Research on new transportation technology. Written paper and presentation about the technology.

Suggested Assessment
(at instructor's discretion)

- Written paper (40%)
- Presentation (40%)
- Class participation (20%)

4.3 Where *Are We* Going?

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 1, 2, 4, 5, 6, 7, 11, 12, 13, 14
- 3.1 H 1, 4, 5
- 3.2 A 1, 2, 4, 6
- 3.2 B 1, 3, 4
- 3.2 C
- 3.2 D 1, 2, 3, 6, 7, 8, 9, 10, 12
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C, D
- 3.4 A, B
- 3.5 A 1, 3, 4
- 3.5 B, C

Science

- 5.2
- 5.4
- 5.8
- 5.9
- 5.10

Social Studies

- 6.2
- 6.3
- 6.4
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

4.3 Where *Are We* Going?

Visions of the Future - Discussion Guide

Use the following questions to guide a class discussion or as a homework activity.

- Who is responsible for this vision and when was it created?
- Briefly describe how transportation is envisioned in the future.
- Which of the predictions about transportation proved accurate?
    - How have those innovations changed the way we travel or move goods?
    - What have been some positive and negative impacts of those innovations?
    - What has been developed that is similar but not exactly as the author described?
- Which of those predictions did not happen?
    - What are some of the barriers and challenges that have prevented their development?
    - Are the ideas still relevant in today's world? If not, what changed to make them irrelevant?
    - Are there any technologies described that you would like to see created in your lifetime?
- What major technological changes did the creator not anticipate?
    - How have these changes impacted transportation since the vision was created? Think about impacts such as computing technology, the internet, and environmental awareness.

4.3 Where *Are We* Going?

Homework Handout

Vision of the Future

Have you ever seen an old magazine cover where people travel in flying cars and use other "fantastic" inventions in their everyday lives? Now, using the Web Resources below and other sources, you're going to research a specific vision of transportation. The vision must be at least twenty years old (preferably older) and provide a description of what was predicted for the future. Bring your vision to class with notes for a group discussion.

Web Resources

New York Times
"Visit to the World's Fair of 2014"
Text of an article from 1964 by Isaac Asimov.
http://www.nytimes.com/books/97/03/23/lifetimes/asi-v-fair.html

Pixelmatic
"Will Life Be Worth Living in 2000 A.D.?"
Text of an article from 1961.
http://www.pixelmatic.com.au/2000/

Popular Mechanics
"The Greatest Hits (And Misses) of Popular Mechanics"
Celebrates 100 years of futuristic predictions.
http://www.popularmechanics.com/science/time_machine/1288761.html?page=1&c=y

Smithsonian Institute
"Yesterday's Tomorrows: Past Visions of the American Future"
Traveling exhibition that "explores the history of the future."
http://www.yesterdaystomorrows.org/about.html

University of California Berkeley Library
"Transportation Futuristics"
Information and image galleries.
http://www.lib.berkeley.edu/news_events/exhibits/futuristics/

4.3 Where *Are We* Going?

The Past Meets the Future - Discussion Guide

Use the following questions to guide a class discussion or as a homework activity.

- What do you see as the most significant changes in transportation and what was the need that led to it? What demand was not being met?
- What transportation needs do you see today? Where do you want to go today that you find difficult to get to? Why? What would have to change for you to be able to travel where you want to?
- Think about all of the changes that have happened in transportation. What do you see as some of the major trends?
    - What is happening to the size of vehicles?
    - What about the flexibility and adaptability of our transportation systems?
    - Are we building systems that are geared more toward the individual or the public, i.e., transit vs. highways?
    - What is happening with the speed of transportation?
    - Are systems becoming more automated?
- Do you think these trends will continue? Let's think about each trend and some possibilities that haven't been developed yet.
- What current issues involve transportation (rising oil prices, global warming, air pollution, etc.) and what will the impact be on the transportation of the future?
- Where do you think you will be traveling every day in 50 years? How will you be getting there?
- What are some trips that you make today that you are unlikely to make in the future? For example:
    - Do you think you will still go to a library or will all information be available over the internet?
    - Will you still go to a movie theater or will you watch movies at home?
    - Where will you work? Will you telecommute?
    - Will you buy your food, clothing, electronics, books, etc., at individual stores, large multi-purpose stores, or online?

4.3 Where *Are We* Going?

Homework Handout

The Past Meets the Future

Traveling back in time, you're going to find that not all transportation we use today was popular or even invented! Using the Web Resources and the school library, research the types of transportation available during the time period you have been assigned. What advances were made? Bring notes to class for a discussion.

Web Resources

New Jersey Department of Transportation
"Publications"
http://www.nj.gov/transportation/publicat/

Smithsonian Institute
"America on the Move"
A resource for transportation history.
http://americanhistory.si.edu/onthemove/

"Learning Resources"
http://americanhistory.si.edu/onthemove/learning/

New Advances in Transportation

Popular culture is filled with visions of how people will travel in the future. This activity will give you an opportunity to investigate some new technologies that experts are actually working on today. You may see many of these developed and deployed in your lifetime, and some of them have the potential to profoundly impact the transportation choices you have in the future. Your assignment is to pick one of the topics below (or decide upon a separate topic with your instructor), answer the following questions, and present your findings to the class.

Research topics: (pick one)

- Sub-orbital flight
- Maglev trains
- Automated guideways
- Personal Rapid Transit
- Segway
- Intelligent Transportation Systems (ITS)
- Alternative fuels (including Cold Fusion)
- On-demand delivery systems
- Telecommunication advances

For this assignment you will need to answer the following questions:

- Briefly describe the technology. Who are the key people or organizations working on it?
- How will it be used? How will the technology be applied in the real world?
- What is the current state of development? Is it in use anywhere in the world? When is the technology most likely to be used on a regular basis?
- What major challenges still need to be overcome? What other technological advances are necessary for this technology to succeed?
- What impact will the technology have on transportation?
- What are the major potential benefits and negative consequences?
  - How will it impact the environment?
  - How will it impact the economy?
  - How will it impact society?
  - Who is likely to benefit the most from the technology?

4.3 Where *Are We* Going?

Homework Handout

Your Own Vision

This is an opportunity for you and your team to invent a new type of transportation. Think about what you have learned in the previous parts of this exercise: past visions of the future, how transportation has advanced, and new technologies that are currently in development. Now it is time for you to develop your own vision of future transportation and create a completely new technology, a new application of current technology, or a radical modification of existing technology. You should be creative and imaginative, but follow these rules:

- You must propose something that is not currently in use
- Your invention must satisfy some transportation need

For this assignment, your group must develop a presentation along with a written paper that answers the questions below. For the presentation, you will play the part of inventors proposing your invention to a group of investors (the rest of the class). The purpose of the presentation is to convince the investors to financially support your proposal. You must convince your classmates that your idea will have a profound and positive impact on society and the economy. Presentations should include pictures, diagrams, maps, and any other device that would be useful to explain the necessity for your invention or innovation.

The investors are responsible for deciding whether or not to support your invention or innovation and will ask you questions about your proposal. The investors will then vote, based on the presentation and answers to questions, whether or not to support the proposal.

For this assignment you will need to answer the following questions:

- What is your invention?
- How will your invention be used and who will use it?
- What transportation need does your invention meet?
- Is your invention feasible now? If not, what technological changes/innovations are necessary?
- What impact will your invention have on society and the environment?
- What will be possible because of your invention that is not possible now?
- What are some of the potential negative consequences of your invention?

5

Unit 2

Transportation and Public Health

5.1 What Can *You* Do?

In this exercise, you'll learn ways that you can do things individually to help the environment, educate the public, and take care of your health.

Objective

Students will explore health risks that result from a car-dependent lifestyle. Students will create a "Transportation and Public Health" campaign to educate parents and peers.

Materials

- NJFIT handout (Page 42)
- "Transportation and Public Health" Brochure homework handout (Page 43)
- Computers with internet access
- Art supplies
- Scanner
- Class email account

Procedure

The instructor will brainstorm with students the pros and cons of both a car-dependent lifestyle and a physically active lifestyle (one that allows for moderate amounts of car travel). Students will ultimately decide which lifestyle is healthier and whether their own town in New Jersey is walking- and biking-friendly. The instructor will then give students the NJFIT: Future in Transportation handout, introducing them to the program and how the state of New Jersey is taking these important issues into account.

Transportation and Public Health Brochure Activity

Working either individually or in groups, students will be given instructions on how to create a season-specific "Transportation and Public Health" brochure either at home or in class. Students should be given two to three days to create the brochure, and will then present their projects to the class. Students will vote on their favorite brochure for each season, and these four will be the official brochures for the class' "Transportation and Public Health" campaign. The brochures could be scanned into computers and then reproduced or emailed to an online mailing list of parents and peers at the start of each season.

Duration

Two or three class sessions with possibly two or three homework sessions allowed for brochure creation. One class session for brochure presentation.

Homework

"Transportation and Public Health" brochure and prepare for presentation of brochure.

Suggested Assessment

(at instructor's discretion)

- Brochure: quality, completeness, and creative use of factual information (70%)
- Class participation (30%)

5.1 What Can *You* Do?

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Visual and Performing Arts

- 1.1 A 3
- 1.1 B 3
- 1.2 D 1, 2

Comprehensive Health and Physical Education

- 2.1 A 2, 3
- 2.1 B 3
- 2.1 D 1, 4
- 2.1 E 1, 2
- 2.2 A 1, 2
- 2.2 B 1, 2, 3
- 2.2 C 1
- 2.2 E 5
- 2.5 A 4
- 2.6 A 1, 2, 3, 5
- 2.6 C 2, 3, 5

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 1, 2, 4, 5, 6, 7, 11, 12, 13, 14
- 3.1 H 1, 4, 5
- 3.2 A 1, 2, 4, 6
- 3.2 B 1, 3, 4
- 3.2 C
- 3.2 D 1, 2, 3, 6, 7, 8, 9, 10, 12
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C, D
- 3.4 A, B
- 3.5 A, B, C

Science

- 5.4
- 5.5
- 5.10

Social Studies

- 6.2
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

5.1 What Can *You* Do?

NJFIT Article Handout

From www.state.nj.us/transportation/works/njfit/about/

New Jersey FIT: Future In Transportation

Would you like to avoid sitting in traffic?

Would you like to walk or bike to work, school, or the train?

Are you concerned about speeding, crashes, or pedestrian safety?

Do you worry about the loss of local business?

Would you like to see development shaped to be more sustainable?

Would you like to get more benefit out of transportation dollars?

The New Jersey Department of Transportation (NJDOT) in partnership with the Office of Smart Growth (OSG) and other state agencies, is working in new ways and on new fronts with counties, municipalities, and other stakeholders to re-invest in New Jersey's communities. This effort is known as **NJFIT**: **Future In Transportation.**

It is becoming increasingly apparent that current land use development trends in New Jersey are unsustainable. Recent studies reveal that, in spite of one of the biggest road building campaigns in history, congestion around the country is worsening. While congestion levels are rising, our transportation funds are shrinking and land prices are soaring, further limiting our ability to meet the demand for infrastructure capacity. Meanwhile, the health of our citizens is also declining as our land use sprawls. The Center for Disease Control (CDC) has classified this rapid deterioration of public health as the "Inactivity Epidemic" and is warning Americans that there are physical impacts of inactivity.

These concerns can no longer be ignored: it's time to make our transportation systems and communities healthier. New Jersey can and must make smart, lasting investments in its communities.

With the launch of **NJFIT**, NJDOT is changing the way we do the business of transportation in New Jersey. **NJFIT** is a comprehensive and cooperative approach to transportation and land use planning. By working with community planners, we can keep the jobs, services, goods, and people that we all seek within reach of every New Jersey citizen. By reinvesting in our infrastructure and shaping transportation to fit into the context of our communities, we are building a better New Jersey for all of us.

5.1 What Can *You* Do?

Homework Handout

Transportation and Public Health Brochure

This is your chance to spread the word about transportation and public health! Using the following guidelines, create a four-page brochure illustrating to your parents and friends the importance of a physically active lifestyle.

- Choose one of the four seasons as your theme (Fall, Winter, Spring, or Summer).
- The brochure's title should read: "Transportation and Public Health in (**your chosen season**)"
- Show how both physical activity and inactivity affect:
  - **Health** (page one)
  - **Transportation** (page two)
  - **Environment** (page three)
- On page four, list various tips for what your parents and friends can do to increase physical activity and positively affect your community in the season you've chosen. Cite any sources used.
- Include a typed webography of your sources (separate from the brochure).
- **Be creative and inventive!** Use pictures, eye-catching fonts, and make your brochure engaging to the public.

5.1 What Can *You* Do?

Web Resources

Environmental Protection Agency
"EPA Student Center"
Intended for students in grades 5-8.
http://www.epa.gov/students/

"How Ground-level Ozone Affects the Way We Live & Breathe"
http://www.epa.gov/air/urbanair/ozone/

"Terms of Environment: Glossary, Abbreviations and Acronyms"
Commonly used environmental terms defined in non-technical language.
http://www.epa.gov/OCEPAterms/aterms.html

Federal Highway Administration
"Focus on Congestion"
http://www.fhwa.dot.gov/congestion/

It All Adds Up To Cleaner Air
http://www.italladdsup.gov

New Jersey Department of Environmental Protection
http://www.state.nj.us/dep/

New Jersey Future in Transportation (NJFIT)
"Useful Links"
http://www.state.nj.us/transportation/works/njfit/links/

Nutrition.gov
http://www.nutrition.gov/

5.2 What Can *Your* Community Do?

Now that you've learned that you and your peers can improve your health by increasing your physical activity, what can your community do to aid you in this endeavor?

Objective

Using brainstorming sessions and Web Resources on sprawl, Transit Villages, and Community Transformation examples, students will understand how planning and design decisions impact the health of communities.

Materials

- Community Transformation Questions handout (Page 47)
- Homework handout (Page 48)
- Homework Extension handout (Page 49)

Procedure

The instructor will brainstorm with the students the factors/issues they would like a developer to consider when developing a community. Students will then be given a Community Transformation handout, which lists questions related to the Community Transformation examples on the Sierra Club Web site (link found in the Web Resources). The instructor will decide how best to display the Web site, and show the students one complete town example. After, the instructor may choose a town not discussed and display its "Existing Conditions" photograph. Students will then spend ten to fifteen minutes listing how they would improve this community using the handout. They will discuss their suggestions with the class, and the instructor will show the improvements suggested on the Web site. While these communities are from around the country, students will also be asked if they can identify similar examples in New Jersey.

The discussion will then focus on sprawl and ways to combat it. Students will be given a homework handout, which directs them to use Web Resources for research on sprawl and NJDOT's Transit Village Initiative. They will answer the questions on the handout and be prepared to discuss their answers in the following class session.

Duration

One class session.

Extensions

If the instructor does not use the Community Transformation Web site in his or her lesson, students may be instructed to take photographs of their community, and bring them to class with answers to the questions on the handout, relating the exercise instead to their own community.

Homework

Read "Sprawl Overview" and "Transit Village Initiative" articles found on Web sites. Complete questions on homework handout.

Suggested Assessment

(at instructor's discretion)

- Community Transformation assignment: quality, completeness, and originality (40%)
- Class participation (40%)
- Homework questions on sprawl and Transit Villages (20%)

5.2 What Can *Your* Community Do?

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Visual and Performing Arts
- 1.2 D 1, 2

Comprehensive Health and Physical Education
- 2.1 A 2, 3
- 2.1 B 3
- 2.1 E 1, 2
- 2.1 F 7
- 2.2 B 1, 2, 3

Language Arts Literacy
- 3.1 A, C, D, E, F
- 3.1 G 1, 2, 4, 5, 6, 7, 11, 12, 13, 14
- 3.1 H 1, 4, 5
- 3.2 A 1, 2, 4, 6
- 3.2 B 1, 3, 4
- 3.2 C
- 3.2 D 1, 2, 3, 6, 7, 8, 9, 10, 12
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C
- 3.4 A, B
- 3.5 A, B, C

Science
- 5.2
- 5.4
- 5.5

Social Studies
- 6.2
- 6.5
- 6.6

Technological Literacy
- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills
- 9.1
- 9.2

5.2 What Can *Your* Community Do?

Community Transformation Handout

Using previous Community Transformations as examples, list five things you would change in the displayed town to halt sprawl and explain why.

1. _____
2. _____
3. _____
4. _____
5. _____

How have your changes improved the health of townspeople?

_____
_____
_____
_____
_____

How have your changes improved the town infrastructure?

_____
_____
_____
_____
_____

How have your changes made an effort to halt suburban growth?

_____
_____
_____
_____
_____

5.2 What Can *Your* Community Do?

Homework Handout

Using the Web Resources, research the term "sprawl" and answer the following questions:

- Is your town experiencing sprawl? If yes, give some examples.
- If yes, what could be done or is being done to combat it?
- If no, could your town experience sprawl? Why or why not? What can your town do to combat it?
- What can you do to make your community aware of sprawl?

Based on the NJFIT article you read about Transit Villages, answer the following questions:

- Do some research to see if your town is a Transit Village. If it isn't, do you think your town could qualify? Why or why not?
- If your town has not been designated a Transit Village, do you think becoming a Transit Village could help your town? Why or why not?
- If your town has been designated a Transit Village, do you think it has helped your community? Why or why not?
- What are the pros and cons to becoming a Transit Village?
- Do you believe this is an effective way to combat sprawl? Why or why not?

Using the Web Resources, research any other suggestions for combating sprawl and choose one you feel would best combat it. Discuss why you feel this way, and include evidence to support your opinion.

5.2 What Can *Your* Community Do?

Homework Extension Handout

Take photographs of a section of your community you feel is experiencing signs of sprawl. Bring that photograph to class along with answers to the following questions.

List five things you would change to halt sprawl in this section of your community, and explain why.

1. _____
2. _____
3. _____
4. _____
5. _____

How have your changes improved the health of townspeople?

_____
_____
_____
_____
_____

How have your changes improved the town infrastructure?

_____
_____
_____
_____
_____

How have your changes made an effort to halt suburban growth?

_____
_____
_____
_____
_____

5.2 What Can *Your* Community Do?

Web Resources

Association for the Advancement of Retired Persons (AARP)
"Livable Communities: An Evaluation Guide"
http://www.aarp.org/research/housing-mobility/indliving/d18311_communities.html

Architecture Week
"A More Sustainable Urban Environment"
http://www.architectureweek.com/2002/0821/environment_2-2.html

Federal Highway Administration
"Planning, Environment, & Realty (HEP)"
http://www.fhwa.dot.gov/environment/index.htm

New Jersey Chapter of the American Planning Association
"Related Links"
http://www.njapa.org/links.html

New Jersey Future in Transportation (NJFIT)
"Case Studies: Evidence of Progress"
http://www.state.nj.us/transportation/works/njfit/case/

"Transit Village Initiative – Statewide"
Information on NJDOT's community development program.
http://www.state.nj.us/transportation/works/njfit/case/villages.shtm

"Transit Village Criteria"
http://www.state.nj.us/transportation/community/village/criteria.shtm

Sierra Club
"Community Transformation Examples"
Computer simulations that show hypothetical development improvements in communities.
http://www.sierraclub.com/sprawl/community/transformations/index.asp

"Sprawl Overview"
http://www.sierraclub.org/sprawl/overview/

6

Unit 3

Transportation and the Environment

6.1 Transportation and the Ecosystem

6.2 Let's Listen to the Story

6.3 Welcome to Transportationville, USA

6.1 Transportation *and the* Ecosystem

Whenever we ride in buses and cars, exhaust fumes from our vehicles travel into the air. When large transportation projects are constructed, such as new train tracks or bridges, there is an ecosystem involved. Just how do our transportation habits affect the environment, and what steps are taken to protect it? This exercise will help students examine the impacts of transportation on its surrounding ecosystems.

Objective

To better understand the environmental effects of transportation systems, students will familiarize themselves with the functioning of an ecosystem and the energy sources being used today. This will involve short activities to discuss what an ecosystem is and explore how its components are connected. It is also important to recap the sources of energy being used in the world today, the differences between renewable versus non-renewable, and the impacts of using these energy sources on the environment.

Materials

- Flip-chart
- Markers
- What is an Ecosystem? Questions handouts (Pages 55-56)
- What is an Ecosystem? diagram handout (Page 57)
- Renewable/Non-Renewable Energy Sources handout (Page 58)
- Impacts of Transportation Systems on an Ecosystem handout (Page 59)
- Homework handout (Page 60)

Procedure

As background and an introduction to this theme, the instructor may introduce important terms using the following format.

What is an Ecosystem? Activity

The instructor will introduce the term ecosystem, and, using the diagram and Questions handouts, help facilitate discussion with regards to how fragile an ecosystem is, and how interconnected its components are.

Renewable and Non-Renewable Energy Sources Activity

The instructor will brainstorm with the class a list of renewable and non-renewable energy sources. In pairs, using the handout, students should categorize the energy sources identified.

Impacts of Transportation Systems on an Ecosystem Activity

Using the handout to collate their notes, students will develop a list of annotated bullets to explain how a transportation system (from its construction to its operation) impacts each of the four general components of an ecosystem. The instructor can either brainstorm with the whole class to start this activity or get students to work in pairs and compete for the most impacts under each category. Groups/pairs might concentrate on a specific type of transportation.

How Do Transportation Systems Impact People and Society? Activity

The instructor will discuss with students both the positive and negative impacts of transportation systems on people and society.

6.1 Transportation *and the* Ecosystem

Homework

Students should look through local newspapers and identify two or three local transportation issues or planning projects that are affecting the ecosystem. For each issue or planning project they identify, they will answer the following questions:

- What is the planning project or issue?
- Where is it located?
- What are the key problems being discussed or addressed?
- Who are the key players or stakeholders involved?
- What are the social, economic, or environmental impacts discussed?
- What solutions are being suggested?
- Where could you find out more information or become involved?

Duration:
Two weeks or longer to track the articles.

Suggested Assessment

(at instructor's discretion)

- Class participation (50%)
- Homework (50%)

6.1 Transportation *and the* Ecosystem

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Comprehensive Health and Physical Education

- 2.1 A 2, 3
- 2.1 B 3

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 13, 14
- 3.2 A 1, 2, 4, 6
- 3.2 C
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C
- 3.4 A, B

Science

- 5.4
- 5.8
- 5.9
- 5.10

Social Studies

- 6.2
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

6.1 Transportation *and the* Ecosystem

What Is An Ecosystem? Questions Handout

Page One

For each of the twelve links depicted by an arrow in the ecosystem diagram, list one example of what is being illustrated.

Example:
Link 1: Fauna to Atmosphere – "Animals and humans (fauna) release CO_2 into the atmosphere".

Link 1: Fauna to Atmosphere _____

Link 2: Atmosphere to Fauna _____

Link 3: Soil to Fauna _____

Link 4: Fauna to Soil _____

Link 5: Soil to Flora _____

Link 6: Flora to Soil _____

Link 7: Flora to Atmosphere _____

Link 8: Atmosphere to Flora _____

Link 9: Atmosphere to Soil _____

Link 10: Soil to Atmosphere _____

Link 11: Flora to Fauna _____

Link 12: Fauna to Flora _____

What Is An Ecosystem? Questions Handout

Page Two

Think of ways in which humans affect and impact the four (4) components of an ecosystem—Atmosphere, Flora, Fauna, and Soil—and their interaction.

Example:

"Deforestation, or removing vegetation, would reduce the amount of water returned to the atmosphere through evaporation and evapotranspiration. This can lead to less water in the atmosphere and increase the chances of drought, which in turn can impact other vegetation growth."

Component 1: Atmosphere _____

_____

_____

_____

_____

Component 2: Flora _____

_____

_____

_____

_____

Component 3: Fauna _____

_____

_____

_____

_____

Component 4: Soil _____

_____

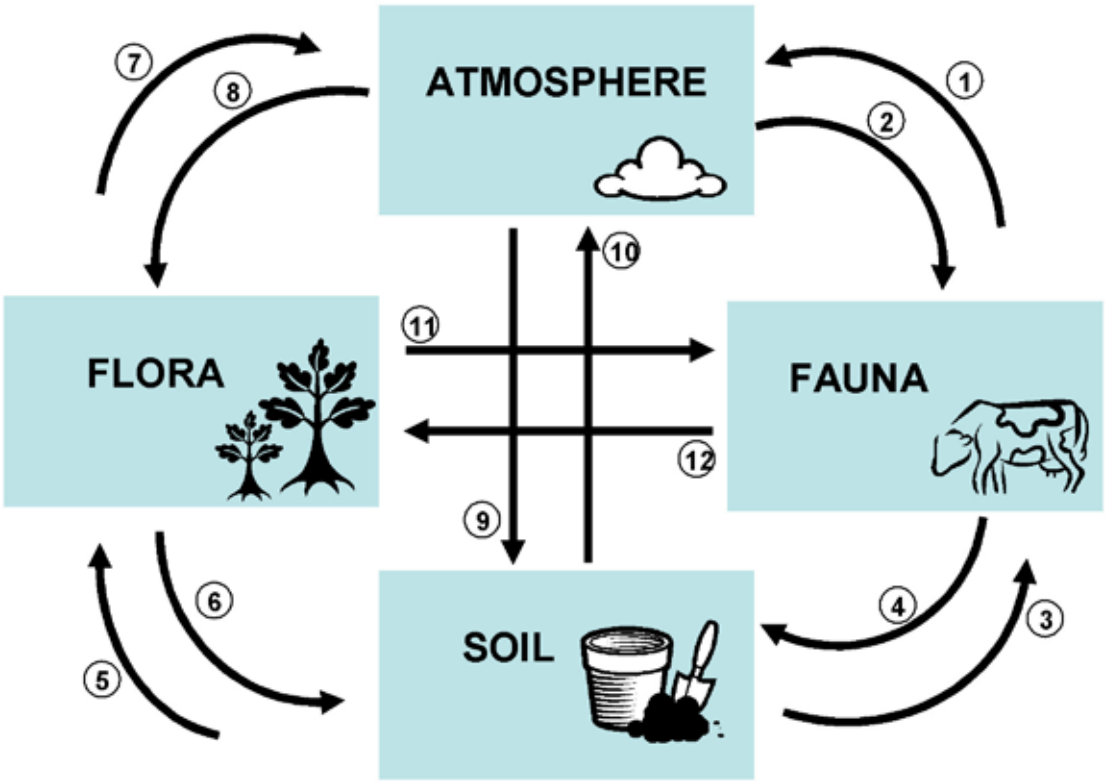
_____

_____

_____

6.1 Transportation *and the* Ecosystem

What Is An Ecosystem? Diagram Handout



Renewable/Non-Renewable Energy Sources Handout

Renewable Energy Sources	Non-Renewable Energy Sources

6.1 Transportation *and the* Ecosystem

Impacts of Transportation Systems on an Ecosystem Handout

For each ecosystem component listed below, compile a list explaining how a transportation system (from its construction to its operation) impacts that component.

Atmosphere	**Soil**
Flora	**Fauna**

6.1 Transportation *and the* Ecosystem

Homework Handout

How Do Transportation Systems Impact People and Society?

Look through your local newspapers and identify two or three local transportation issues or planning projects that are affecting the surrounding ecosystem.

For each issue or planning project identified, answer the following questions:

- What is the planning project or issue?
- Where is it located?
- What are the key problems being discussed or addressed?
- Who are the key players or stakeholders involved?
- What are the social, economic, or environmental impacts discussed?
- What solutions are being suggested?
- Where could you find out more information or become involved?

6.1 Transportation *and the* Ecosystem

Web Resources

Environmental Protection Agency
"EPA Student Center"
Intended for students in grades 5-8.
http://www.epa.gov/students/

"Teaching Center"
http://www.epa.gov/teachers/

"Terms of Environment: Glossary, Abbreviations and Acronyms"
Commonly used environmental terms defined in non-technical language.
http://www.epa.gov/OCEPAterms/aterms.html

National Oceanic and Atmospheric Association (NOAA)
"Global Warming"
http://www.ncdc.noaa.gov/oa/climate/globalwarming.html

Natural Resources Defense Council
"Reference/Links"
http://www.nrdc.org/reference/

New Jersey Department of Environmental Protection
http://www.state.nj.us/dep/

6.2 Let's Listen *to the* Story

Music is more than entertainment; it's also an essential tool for raising awareness about important issues. This exercise will examine how music, transportation, and the environment can be linked, and introduce students to points of view different from their own.

Objective

This exercise will help students understand that there are numerous sources from which we can gather information. It will help students to look at different perspectives and ideas, using literature, music, the media, and the internet. Students will continue to develop their understanding of how transportation is linked to urban growth and how it can impact society.

Materials

- CD player
- Internet access for songs
- Let's Listen handout (Page 64)
- Suggested song lyric handouts (Pages 65-66)
- Homework handout (Page 67)
- Homework extension handout (Page 68)

Procedure

The instructor will begin by asking the class to name the different types of sources we use to learn about and understand different perspectives and viewpoints, e.g. TV, radio, newspapers. The instructor will then introduce the idea of using song lyrics to do this as well.

Distribute the lyrics to one or two songs that are related to the environment and transportation. Distribute the "Let's Listen" handout, and then play the songs for the class, asking them to complete the handout while listening and following along.

Suggested songs:

- "Build" – Housemartins
- "Big Yellow Taxi" – Joni Mitchell (or contemporary versions)

Homework

The instructor will ask the students to think about the lyrics to some of the songs they enjoy listening to, and which of those songs talk about how humans affect the environment through growth and development. They will be asked to bring in the music and lyrics and be prepared to share thoughts with the rest of the class. They should ask their parents and grandparents if they know of any lyrics or songs as well.

Duration:

One to two nights. One class period for discussion.

Extensions

A short essay about the song lyrics the student chooses for class.

Suggested Assessment

(at instructor's discretion)

- Class participation (50%)
- Homework (40%)

6.2 Let's Listen *to the* Story

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Visual and Performing Arts

- 1.1 A 3
- 1.1 B 4
- 1.3 B 3
- 1.5 A 2
- 1.5 B 2

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 13, 14
- 3.2 A 2, 4, 6
- 3.2 C
- 3.3 A 1, 2, 3, 4, 6, 7
- 3.3 B, C
- 3.4 A, B
- 3.5 C 1, 2

Science

- 5.2
- 5.4
- 5.10

Social Studies

- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2

6.2 Let's Listen *to the* Story

Let's Listen Handout

While listening to the songs and reading the lyrics, answer the following question for each of the categories listed:

What issues do you think the song is describing?

Social (people, health, community) _____

_____

_____

_____

_____

_____

_____

Environmental (flora, fauna, and the world around us) _____

_____

_____

_____

_____

_____

_____

Economic (employment, income, wealth) _____

_____

_____

_____

_____

_____

_____

6.2 Let's Listen *to the* Story

Suggested Song Lyric Handout

"Build"

By *Housemartins*

Clambering men in big bad boots
Dug up my den, dug up my roots.
Treated us like plasticine town
They build us up and knocked us down.

From Meccano to Legoland,
Here they come with a brick in their hand,
Men with heads filled up with sand,
It's build.

Chorus:
It's build a house where we can stay,
Add a new bit everyday.
It's build a road for us to cross,
Build us lots and lots and lots and lots.

Whistling men in yellow vans
They came and drew us diagrams.
Showed us how it all worked out
And wrote it down in case of doubt.

Slow, slow, quick, quick, quick,
It's wall to wall and brick to brick,
They work so fast it makes you sick,
It's build.

Chorus:
Down with sticks and up with bricks,
In with boots and up with roots,
It's in with suits and new recruits,
It's build...

6.2 Let's Listen *to the* Story

Suggested Song Lyric Handout

"Big Yellow Taxi"

By *Joni Mitchell*

They paved paradise
And put up a parking lot,
With a pink hotel, a boutique
And a swinging hot spot.
Don't it always seem to go,
That you don't know what you've got
Till it's gone—
They paved paradise
And put up a parking lot!

They took all the trees,
Put 'em in a tree museum;
And they charged the people
A dollar and a half just to see 'em.
Don't it always seem to go,
That you don't know what you've got
Till it's gone—
They paved paradise
And put up a parking lot!

Hey farmer, farmer,
Put away the DDT now;
Give me spots on my apples,
But leave me the birds and the bees—
Please!
Don't it always seem to go,
That you don't know what you've got
Till it's gone—
They paved paradise
And put up a parking lot!

Late last night,
I heard my screen door slam,
and a big yellow taxi
Took away my old man.
Don't it always seem to go,
That you don't know what you've got
Till it's gone—
They paved paradise
And put up a parking lot!

I said don't it always seem to go,
That you don't know what you've got
Till it's gone—
They paved paradise
And put up a parking lot!

They paved paradise
And put up a parking lot . . .

They paved paradise
And put up a parking lot.

6.2 Let's Listen *to the* Story

Homework Handout

Think about a song you enjoy listening to that deals with how humans affect the environment through growth and development. Bring in the music and lyrics and be prepared to share the song and your thoughts with the rest of the class. You can also ask your parents or grandparents if they know of any songs from when they were growing up.

Use the following questions to help you to prepare your presentation to the rest of the class:

- What is the song and who wrote the lyrics?
- When was it written?
- What are the messages the songwriter is trying to tell us about transportation, development, and the environment?

6.2 Let's Listen *to the* Story

Homework Extension Handout

Using the song you've chosen, write a one-page essay answering the following questions.

- What is the song's overall message?
- How does the song relate to transportation and the environment?
- Did these lyrics introduce you to a point of view different from your own?
- Do you agree with or understand this point of view? Why or why not?
- Do you think the ideas are well presented? Why or why not?

6.2 Let's Listen *to the* Story

Web Resources

Grinning Planet
"Environmental Songs"
http://www.grinningplanet.com/6001/environmental-songs.htm

MP3.com
Songs available for purchase.
http://www.mp3.com

Songs for Teaching
http://www.songsforteaching.com/environmentsongs.htm

6.3 Welcome *to* Transportationville, *USA*

Here is your chance to be a part of the process! You've learned about the positive and negative effects of transportation, and you've learned about the different resources people have to make their opinions known. This exercise will teach you how to take advantage of the ultimate resource—a public meeting. You and your classmates will become the citizens and officials of Transportationville, USA, a fictional town where a controversial transportation proposal is causing a divide, and it's up to you and your classmates to reach a resolution!

Objective

Students will engage in a role-playing exercise based on the fictional town of Transportationville, USA. Students will be able to apply what they have learned so far and conduct further research to take on the role of key stakeholder groups that are usually engaged in the urban planning process. This project will involve a proposal made by the town of Transportationville to build a new bridge over the Jersey River that would better connect the two parts of the town currently served by a ferry operator. Currently, the closest bridge crossing is some 15 miles downstream, adding one hour to the journey by road. Students will continue to realize that the impacts of transportation can be both positive and negative, and that not all parties realize the same levels of benefits versus impacts as a result of a particular transportation project. It will become clear that the positive and negative impacts of a transportation project affect each group or stakeholder involved differently.

Materials

- Internet access for research
- Art supplies for presentation
- Map of Transportationville, USA handout (Page 73)
- Group Assignments handout (Page 74)
- Guidelines for a Presentation handout (Page 75)
- Background Terms and Web Resources handouts (Pages 76)
- Public Information handouts (Pages 78-81)
- Private Information/Hidden Agendas handouts (Pages 82-89)
- Grading Sheet handouts (Pages 90-97)

Procedure

The instructor will first brainstorm with students a general list of stakeholders found in a community, such as the ones featured in this exercise. They will then brainstorm different transportation organizations and authorities, such as the Department of Transportation (DOT) or a local Metropolitan Planning Organization (MPO). The instructor may give brief descriptions of New Jersey-based organizations, such as the New Jersey Department of Transportation and North Jersey Transportation Planning Authority.

Students will then be given a map of Transportationville, USA, and the instructor will introduce the proposed bridge project. Students will be encouraged to put forward arguments as to whether they are in favor or against the building of a new bridge, and to present alternatives or modifications to the proposed plans. The instructor will then discuss the mock public meeting, giving the students a date, time, location, and general overview of what is expected of them. Using the "Group Assignments" handout, the instructor will then split the students into groups of stakeholders. The instructor will make copies of this handout for the students' reference.

6.3 Welcome *to* Transportationville, *USA*

The instructor will brainstorm with the students a set of guidelines for a presentation. Afterward, the Guidelines for a Presentation handout will be given to the students to reinforce what they have just learned. The instructor may modify the document to better suit the answers given by the class.

Students will then meet with their groups during the class session, at which point they will be given the Background Terms and Web Resources handouts, which they may use as a starting point for research; the Public Information handouts, which list information about each group that is public knowledge; and then group-specific Private Information/Hidden Agendas handouts, which are to be given to the labeled groups only. The instructor should encourage students to think about arguments the other groups are going to use and be prepared to counter them during the mock public meeting. Students should also be encouraged to form alliances with groups that may have similar viewpoints on the proposed new bridge, to conduct more research outside of the information given, and to meet outside of class. Grading sheets have been provided for aiding the instructor.

Duration:
Two class sessions of introduction and group preparation time. One class period for mock public meeting. Group meetings held at the students' discretion outside of class.

Homework

Research and develop positions and prepare mock public meeting presentation.

Suggested Assessment

(at instructor's discretion)

- Classroom participation (30%)
- Individual contribution to mock public meeting presentation (70%)

6.3 Welcome *to* Transportationville, *USA*

New Jersey Department of Education Adopted Core Curriculum Content Standards - 10/04

Visual and Performing Arts

- 1.2 C 3
- 1.2 D 1
- 1.3 C 4

Comprehensive Health and Physical Education

- 2.1 E 1, 5
- 2.1 F 7
- 2.2 E 1, 2, 3, 5

Language Arts Literacy

- 3.1 A, C, D, E, F
- 3.1 G 1, 2, 4, 5, 6, 7, 11, 12, 13, 14
- 3.1 H 1, 4, 5
- 3.2 C
- 3.3 A, B, C, D
- 3.4 A, B
- 3.5 B 4
- 3.5 C 3

Science

- 5.10

Social Studies

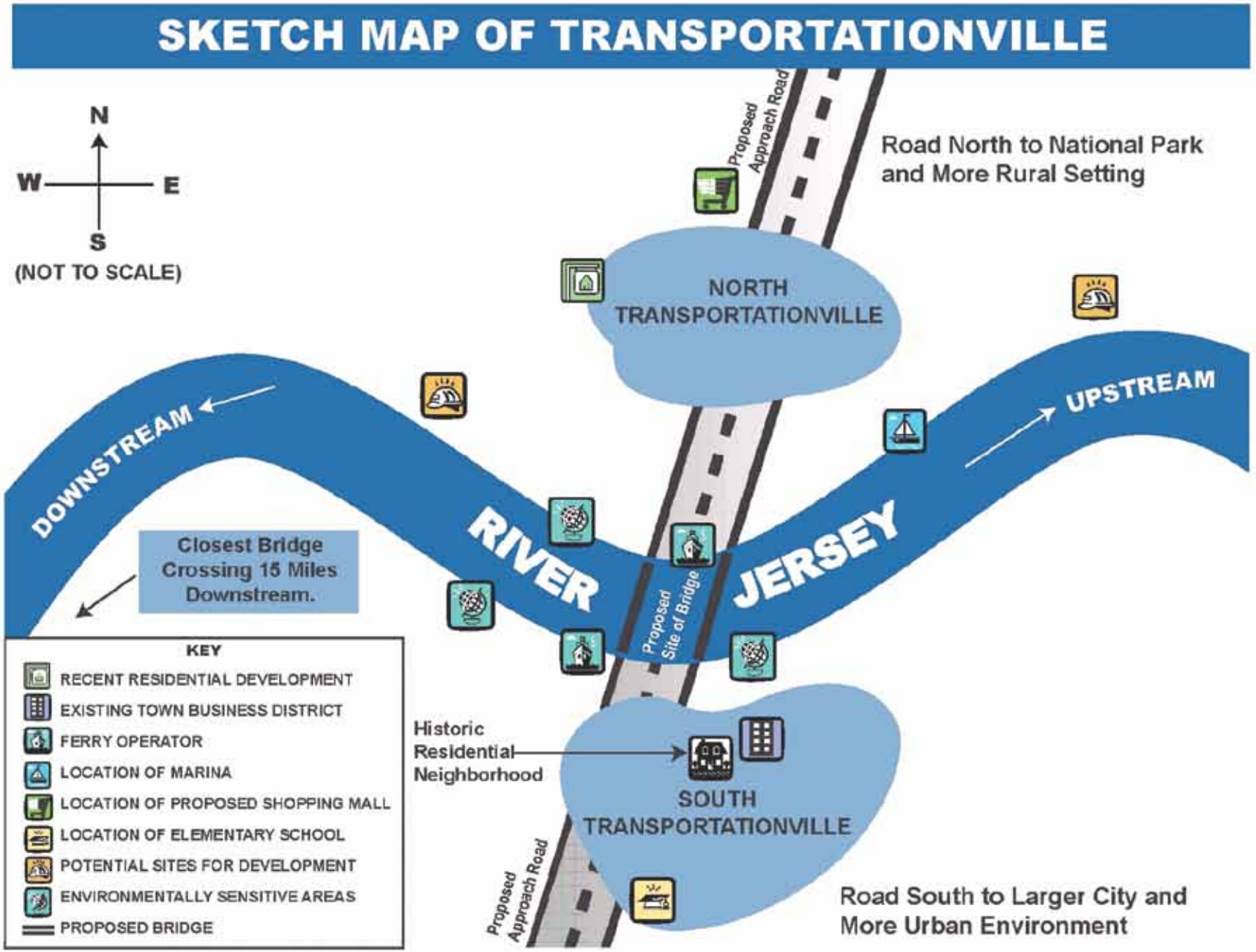
- 6.2
- 6.5
- 6.6

Technological Literacy

- 8.1
- 8.2

Career Education and Consumer, Family and Life Skills

- 9.1
- 9.2


SKETCH MAP OF TRANSPORTATIONVILLE
N
W
E
S
(NOT TO SCALE)
Proposed Approach Road
Road North to National Park and More Rural Setting
NORTH TRANSPORTATIONVILLE
DOWNSTREAM
UPSTREAM
RIVER
JERSEY
Proposed Site of Bridge
Closest Bridge Crossing 15 Miles Downstream.
KEY
RECENT RESIDENTIAL DEVELOPMENT
EXISTING TOWN BUSINESS DISTRICT
FERRY OPERATOR
LOCATION OF MARINA
LOCATION OF PROPOSED SHOPPING MALL
LOCATION OF ELEMENTARY SCHOOL
POTENTIAL SITES FOR DEVELOPMENT
ENVIRONMENTALLY SENSITIVE AREAS
PROPOSED BRIDGE
Historic Residential Neighborhood
SOUTH TRANSPORTATIONVILLE
Proposed Approach Road
Road South to Larger City and More Urban Environment

6.3 Welcome *to* Transportationville, *USA*

Group Assignments Handout

Using this worksheet, assign each student to a group. It is suggested that the number of students be equal in each group, if possible.

Mayor

_____ _____ _____ _____

Environmental Group

_____ _____ _____ _____

Long-Time Resident

_____ _____ _____ _____

Developer

_____ _____ _____ _____

Ferry Operator

_____ _____ _____ _____

Commuter

_____ _____ _____ _____

Local Business Owner

_____ _____ _____ _____

Local School Principal

_____ _____ _____ _____

Guidelines For A Presentation Handout

- Keep eye contact with your audience
- Make sure your posture is correct, suggesting a professional attitude
- Wear clothing that is appropriate and professional
- Make sure each group member participates. The group leader might want to assign different sections of the presentation to different group members.
- Know your facts
- Write bulleted notes for yourself, but don't read them word for word
- Be engaging with your audience—show them why this topic interests you and why it should interest them
- Using existing documents, have displays such as posters, photographs, and maps next to you to illustrate your points. Keep them simple.
- Be prepared to answer all kinds of questions from your audience, both easy and challenging. Once again, know your facts.
- Be prepared for audience members who may be argumentative and/or steadfast in their beliefs. Come up with proactive answers so that all parties feel understood and validated.
- If other groups are presenting, take notes on their presentation. These notes will help formulate questions you can ask. It's also a good idea to have generalized questions prepared that you can adapt during the presentation.

What Else Can You Add?

6.3 Welcome *to* Transportationville, *USA*

Background Terms

Multiplier Effects

Transportation investment can have a direct short-term economic impact, simply because money is spent to hire contractors and purchase materials. This effect is simply the result of spending government money, regardless of the mobility benefits of the transportation project. The money ripples through the regional economy, multiplying the economic impact of the transportation investment. As aptly stated by one scholar, "the State hires a general contractor; the general contractor buys cement; the cement manufacturer hires a new trucker; the trucker buys a new living room set; and so on." Using multipliers from the U.S. Bureau of Economic Analysis, one academic study estimates that $10 million invested in transportation in northern New Jersey would result in approximately $21.5 million in economic output, and approximately 207 jobs.

Accessibility Improvements

Transportation investment can yield long-term economic benefits by increasing accessibility. In this case, "accessibility" is defined as the number of jobs or opportunities that can be reached from a given location within a given amount of travel time. Areas with high levels of accessibility tend to attract growth and development. People choose to live in areas where they can access jobs and other activities. Similarly, businesses choose to locate in areas where their employees and customers can access them. Any transportation project that reduces travel times will result in increased accessibility for a selected area of the region. Because of its increased accessibility, that area of the region typically would become a more desirable place to live or conduct business. Thus transportation improvements can foster economic growth at specific locations where accessibility is increased.

Loss of Natural Habitat

The construction of transportation facilities in rural areas often involves clearing undeveloped land and draining natural wetlands. As a result, animal (fauna) and plant (flora) habitat is lost. Once completed, transportation facilities can cause further harm to natural habitats, by acting as physical barriers that animals cannot cross. These effects can be made worse because transportation can encourage more development. When more rural land is developed, more animal habitat is lost. It should be noted that transportation agencies are required by law to replace wetlands if any are used during the construction of a bridge or road.

Impact on the Urban Environment

In urban areas, transportation poses less of a threat to animal habitat, but it has a serious impact on the built environment in which people live. Transportation does not always blend well with communities, particularly in densely populated areas. Highways, rail lines, and other facilities often are viewed as unattractive. For example, elevated structures block sightlines, cast shadows, and create unwelcoming spaces for pedestrians. Furthermore, transportation infrastructure can bisect and divide neighborhoods, acting as physical barriers that restrict pedestrian activity and community interaction. In many cases, transportation infrastructure is built along a waterfront, thereby cutting off neighborhood access to an important environmental amenity.

Economic Impact of Transportation Investment

Transportation investment has contributed to economic growth, but the extent of that contribution is difficult to measure. Transportation is only one of many influences on a region's economy, and the benefits of transportation investment are not contained within the boundaries of one particular region.

6.3 Welcome *to* Transportationville, *USA*

Web Resources

Delaware Valley Regional Planning Commission
Main Web site for the Central Jersey Metropolitan Planning Organization.
http://www.dvrpc.org/

Related links
http://www.dvrpc.org/hotlinks.htm

Federal Highway Administration
"Planning, Environment, & Realty (HEP)"
http://www.fhwa.dot.gov/environment/index.htm

New Jersey Department of Transportation
"Our Projects and the Environment"
http://www.state.nj.us/transportation/works/environment

New Jersey Future in Transportation (NJFIT)
"Useful Links"
http://www.state.nj.us/transportation/works/njfit/links/

NJ TRANSIT
Web site for New Jersey's public transportation corporation.
http://www.njtransit.com

North Jersey Transportation Planning Authority
Main Web site for the North Jersey Metropolitan Planning Organization.
http://www.njtpa.org

"Additional Resources"
http://www.njtpa.org/links.htm

"Access and Mobility 2030: Regional Transportation Plan Update"
http://www.njtpa.org/planning/rtp2030/rtp2030.html

Rutgers, the State University of New Jersey
"Penns Neck Area Environmental Impact Statement (EIS) site"
www.policy.rutgers.edu/vtc/pennsneckareaeis/index.html

South Jersey Transportation Planning Organization
Main Web site for the Southern New Jersey Metropolitan Planning Organization.
http://www.sjtpo.org/

Related Links
http://www.sjtpo.org/links2.html

2025 Regional Plan
http:www.sjtpo.org/rtp3.html

6.3 Welcome *to* Transportationville, *USA*

Public Information Handout
TO BE GIVEN TO EACH GROUP

Mayor

You are a beloved local hero. You were born and raised in Transportationville and your family has been an important influence in town politics since the town's founding in 1791. Politically, you are a traditionalist from an old local family. Your family has lived in the town for generations, and like most locals, you prefer to generally keep things as they are. Eight years ago, you were elected mayor on a platform of maintaining the traditional character of Transportationville. Four years ago, you won a landslide victory against an opposition who could find little to fault with your term in office. Times are changing in Transportationville. You have proposed building a new bridge across the Jersey River to increase access, reduce congestion, and provide new economic development opportunities for Transportationville. You are now about to run for a third term. Before you proposed the bridge project you were unopposed, but now several candidates have come forward. Some want to stop the bridge. Others feel you are moving too slowly and indecisively.

Environmental Group

You head a small but vocal environmental group in Transportationville. You have seen your influence grow over the past several years as population growth and new development have put pressure on environmental resources. You are concerned about the proposed bridge project because the river is one of Transportationville's unique natural resources. It provides sanctuary for numerous plant and animal species and provides recreational activities for town residents. The ecosystem along the river is a delicate balance that has already been threatened by new residential subdivisions. Natural habitats have been disrupted and storm water runoff carries pollutants from lawns and pavement to the river, where they have already begun to disrupt the local fish population.

6.3 Welcome *to* Transportationville, *USA*

Public Information Handout continued

TO BE GIVEN TO EACH GROUP

Long-Time Resident

Your family has lived in a historic neighborhood in South Transportationville since the town's founding. You were raised here, your kids were raised here, and now your grandchildren are also being raised here. Most of the long-time residents live here and have worked in the town for their entire lives at places such as the school, the post office, the library, the general store, the gas station, etc. Transportationville has historically been a small, quiet town where everybody knows each other. There is a long tradition of caring for neighbors and strong sense of community, making people deeply concerned about changes in their town. You've noticed that the traditional values upon which the town was built have begun to change dramatically in the past several years, particularly with the arrival of new young families with high paying jobs in distant locations. The newcomers seem less concerned about the routine functioning of the town. You see them as people who take advantage of what the town has to offer, but don't provide anything in return. You would like to see the town return to what it was a decade ago. Property values have increased so fast that the children of longtime residents find it harder to afford to live in the town. Even long-time residents who own their homes are finding it difficult to pay the increased tax assessments on their property. The changes are impacting more than just property values. Volunteers for the local fire department are increasingly difficult to find. The local police force is staffed with officers who live in other towns. Teachers can only find affordable housing 40 minutes away.

Developer

With a seemingly constant flow of new residents to the area, land values have been steadily rising with no downturn in sight. You have big plans for the Transportationville area and have been buying up large tracts of land to build new residential houses and commercial developments. Of particular interest to you is a site large enough to build a regional mall. Your economic analysis shows there is tremendous unmet demand for a very large retail establishment. The project promises to offer you millions of dollars in profit. Transportation, particularly access across the river, is the only drawback to your plan. Though you are not always liked, particularly by long-time residents and environmental groups, you have a significant amount of political power and influence. You have helped stimulate economic growth, which has significantly increased tax revenue for the town.

6.3 Welcome *to* Transportationville, *USA*

Public Information Handout continued

TO BE GIVEN TO EACH GROUP

Ferry Operator

Your family has been operating a ferry service across the river for the past fifty years. The entire operation is owned and operated by your family and your children expect to take over the business once you retire in several years. Based on the increase in demand you have seen in recent years, you have recently invested in two new larger car ferries to replace the two ferries that have been in service for several decades. You had to take out substantial loans to finance this purchase. The new bridge across the river threatens to put you out of business permanently. In addition, to construct the south side access road, the ferry landing on the south side of the river will be taken by eminent domain (the power to take private property for public use by the state or municipality with fair compensation). You have diligently served the residents of Transportationville for half a century with only minimal service disruptions. You want the town to show you the same kind of loyalty and save your business.

Commuter

Three years ago you moved to a new residential development in North Transportationville to raise a family. You thought a quiet town with decent schools and plenty of space for recreation would be a perfect environment for your children. You knew you would have to commute a longer distance to your job, but the quality of life the small town offered outweighed the additional commute time. In the past few years, many people have had the same idea. New areas of Transportationville are developed into residential subdivisions almost every month. Traffic congestion, particularly at the river crossing, has become almost unbearable. You and your neighbors have started to demand that the town do something to relieve the congestion. As a relative newcomer, you have no particular vested interest in long-time political leaders or residents. You feel they are out of step with the changing times. However, one of the reasons you moved to Transportationville was because of its quaint charm. You would hate to see that destroyed by overdevelopment.

Public Information Handout continued

TO BE GIVEN TO EACH GROUP

Local Business Owner

You own Joe's Hardware store on Main Street in South Transportationville, which has been in business for seventy-five years. Your grandfather opened the store shortly after he and your grandmother moved to the town. Your father took over the business and trained you. Last year, your father retired and you took over the family business. The past few years have been difficult. Your father had encouraged you to sell the business, but you are determined to make the store successful again. Your limited size and difficult access has made it hard for you to compete with mega stores such as Home Depot and Lowes, but you have managed to remain profitable.

Local School Principal

You are the principal of Transportationville Elementary School. You are responsible for the education of Transportationville's young students. Over the past twenty years that you have been the principal, test scores and graduation rates have steadily increased. The number of students going on to attend college is at an all-time high. Fifteen years ago Transportationville built a new elementary school to accommodate anticipated population growth. For the past several years, the population has grown faster than the projections. A surge in new students has already put pressure on school resources. Classes are full. The old building had been situated right on the main road and traffic had become a hazard for the students, with several near misses of children being struck by speeding cars. When the school switched buildings, a site was chosen that had little traffic and was considered to be a lot safer.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Mayor
FOR THIS GROUP ONLY

You are a beloved local hero. You were born and raised in Transportationville and your family has been an important influence in town politics since the town's founding in 1791. Politically, you are a traditionalist from an old local family. Your family has lived in the town for generations, and like most locals, you prefer to generally keep things as they are. Eight years ago, you were elected mayor on a platform of maintaining the traditional character of Transportationville. Four years ago, you won a landslide victory against an opposition who could find little to fault with your term in office. Times are changing in Transportationville. You have proposed building a new bridge across the Jersey River to increase access, reduce congestion, and provide new economic development opportunities for Transportationville. You are now about to run for a third term. Before you proposed the bridge project you were unopposed, but now several candidates have come forward. Some want to stop the bridge. Others feel you are moving too slowly and indecisively.

You are interested in the bridge project because:

- You believe it is in the best interest of the residents of Transportationville.
- New residents have been moving in, turning the town into a commuting suburb. These new residents have significant and growing political power and are looking to you to improve recreation, expand local services, and most importantly help shorten their commute to work.
- The local budget is under significant stress to provide services the town demands. New residential and commercial growth could provide new sources of tax revenue that are desperately needed.
- Developers have been pressuring you to move forward with the bridge project and have indicated that if you oppose the bridge, they will give financial support to an opposing candidate who will support the project.

As the mayor, you have a delicate balance to maintain. You are well respected in the town for your ability, thus far, to maintain the small town characteristics of Transportationville. You would be seen as a traitor by long-time residents if that changed. Downtown business owners are very worried that a proposed new mall on the other side of the river would devastate their businesses and have a negative impact on local tax revenue. You need the support of these groups for your political survival. At the same time, developers and the new residents are an increasingly powerful political force who may determine your political future.

As you engage in a discussion about the bridge think about the following question:

- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to reach an agreement to build the bridge and to ensure your reelection.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Environmental Group
FOR THIS GROUP ONLY

You head a small but vocal environmental group in Transportationville. You have seen your influence grow over the past several years as population growth and new development have put pressure on environmental resources.

You are concerned about the proposed bridge project because the river over which the bridge will span is one of Transportationville's unique natural resources. It provides sanctuary for numerous plant and animal species and provides recreational activities for town residents. The ecosystem along the river is a delicate balance that has already been threatened by new residential subdivisions. Natural habitats have been disrupted and storm water runoff carries pollutants from lawns and pavement to the river where they have already begun to disrupt the local fish population.

You are particularly concerned about the following impacts the current bridge project will have on the local environment:

- Air pollution is a major concern. Diesel exhaust from the heavy construction equipment, and emissions from the increased traffic the bridge will generate (both during construction and after completion), will increase air pollution in the area around the bridge.
- Noise pollution during the construction phase and from future traffic may disrupt the natural habitat of many species that live along the river.
- Water pollution during construction and from road surface runoff poses a threat to the river ecosystem.
- The bridge will allow more areas of North Transportationville to be subdivided and developed. This would mean less open space.
- You have been campaigning for better public transportation and increased usage. You worry that improving vehicular access across the river will decrease interest in this campaign, providing an incentive for people to use their car instead of public transportation.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to preserve and protect the natural environment in and around Transportationville.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Long-Time Resident
FOR THIS GROUP ONLY

Your family has lived in a historic neighborhood in South Transportationville since the town's founding. You were raised here, your kids were raised here, and now your grandchildren are also being raised here. Most of the long-time residents live here and have worked in the town for their entire lives at places such as the school, the post office, the library, the general store, the gas station, etc. Transportationville has historically been a small, quiet town where everybody knows each other. There is a long tradition of caring for neighbors and strong sense of community, making people deeply concerned about changes in their town. You've noticed that the traditional values upon which the town was built have begun to change dramatically in the past several years, particularly with the arrival of new young families with high paying jobs in distant locations. The newcomers seem less concerned about the routine functioning of the town. You see them as people who take advantage of what the town has to offer, but don't provide anything in return. You would like to see the town return to what it was a decade ago. Property values have increased so fast that the children of long-time residents find it harder to afford to live in the town. Even long-time residents who own their homes are finding it difficult to pay the increased tax assessments on their property. The changes are impacting more than just property values. Volunteers for the local fire department are increasingly difficult to find. The local police force is staffed with officers who live in other towns. Teachers can only find affordable housing 40 minutes away.

You are concerned about the bridge for many reasons:

- The bridge project threatens to permanently destroy the traditional character of the town, by opening up the north side for more development. This could transform Transportationville from a small rural town into a suburb.
- You've also noticed that the bridge approach road is planned to pass right through an area where many long-time residents live. These areas are not as wealthy as the new developments and the impacts of the bridge seem to fall disproportionately on these areas.
- As the population has grown, taxes have also increased in order to pay for additional town services. Taxes will have to increase again to pay for the new bridge. This will be a difficult financial burden for you and other long-time residents who do not have high paying jobs.
- Finally, you feel that the increased traffic the bridge will generate poses serious safety and health risks to residents, particularly children.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to preserve the traditional character of Transportationville.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Developer
FOR THIS GROUP ONLY

With a seemingly constant flow of new residents to the area, land values have been steadily rising with no downturn in sight. You have big plans for the Transportationville area and have been buying up large tracts of land to build new residential houses and commercial developments.

Of particular interest to you is a site large enough to build a regional mall. Your economic analysis shows there is tremendous unmet demand for a very large retail establishment. The project promises to offer you millions of dollars in profit. Transportation, particularly access across the river, is the only drawback to your plan.

Though you are not always liked, particularly by long-time residents and environmental groups, you have a significant amount of political power and influence. You have helped stimulate economic growth, which has significantly increased tax revenue for the town.

You are concerned about the proposed bridge project because:

- It promises to significantly increase access across the river. This would make land on the north side more valuable and you stand to gain financially.
- Increased access will also make the area north of the river more attractive to potential retailers. You already have several potential clients who are interested in retail space you might develop.
- You feel the multiplier effect of developing land north of the river will have a significant positive impact on the financial stability of Transportationville.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to increase access to the north side of the river.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Ferry Operator
FOR THIS GROUP ONLY

You have been operating a ferry service across the river for the past fifty years. The entire operation is owned and operated by your family and your children expect to take over the business once you retire in several years. Based on the increase in demand you have seen in recent years, you have recently invested in two new larger car ferries to replace the two ferries that have been in service for several decades. You had to take out substantial loans to finance this purchase.

The new bridge across the river threatens to put you out of business permanently. In addition, to construct the south side access road, the ferry landing on the south side of the river will be taken by eminent domain (the power to take private property for public use by the state or municipality with fair compensation).

You have diligently served the residents of Transportationville for half a century with only minimal service disruptions. You want the town to show you the same kind of loyalty and save your business.

You are concerned about this bridge because:

- Your survival depends on your ferry service. The new bridge threatens to put you out of business.
- You do not know how you would be compensated for property that will need to be taken if the bridge is built.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to find a way to stay in business, or at least be able to support your family.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Commuter
FOR THIS GROUP ONLY

Three years ago you moved to a new residential development in North Transportationville to raise a family. You thought a quiet town with decent school and plenty of space for recreation would be a perfect environment for your children. You knew you would have to commute a longer distance to your job, but the quality of life the small town offered outweighed the additional commute time.

In the past few years, many people have had the same idea. New areas of Transportationville are developed into residential subdivisions almost every month. Traffic congestion, particularly at the river crossing, has become almost unbearable. You and your neighbors have started to demand that the town do something to relieve the congestion.

As a relative newcomer, you have no particular vested interest in long-time political leaders or residents. You feel they are out of step with the changing times. However, one of the reasons you moved to Transportationville was because of its quaint charm. You would hate to see that destroyed by overdevelopment.

You are interested in the new bridge project for several reasons:

- A new river crossing promises to significantly reduce your commute time. This will allow you to spend more time with your family and less money on gas.
- The new bridge will also make the areas on the north side of the river more accessible. This will increase property values, including your own. Your home is the most significant investment you have and you want to ensure that it appreciates in value.
- You are concerned about the impact the bridge may have on your quality of life. You value the clean air, safe neighborhoods, good schools, open space, and the low cost of living Transportationville offers. You worry that a new bridge may threaten all of those by increasing traffic and allowing more development.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to shorten your commute and maintain your quality of life.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Local Business Owner
FOR THIS GROUP ONLY

You own Joe's Hardware store on Main Street in South Transportationville, which been in business for seventy-five years. Your grandfather opened the store shortly after he and your grandmother moved to the town. Your father took over the business and trained you. Last year, your father retired and you took over the family business.

The past few years have been difficult. Your father had encouraged you to sell the business, but you are determined to make the store successful again. Your limited size and difficult access has made it hard for you to compete with mega stores such as Home Depot and Lowes, but you have managed to remain profitable.

You are very concerned about the new bridge proposed for Transportationville.

- You like the fact that people from the other side of the river will be able to shop more easily at your store. You have heard from many people that one of the reasons downtown businesses are suffering is because of difficult access across the river.

- Your suppliers have also complained about how difficult it is to make deliveries. Congestion at the current river crossing causes delays and increases shipping costs.

- Increased traffic that the bridge will generate near the downtown area may bring more customers to your store.

- However, despite these benefits, you are worried because Home Depot has already indicated that it would like to build a new superstore in North Transportationville, if the new bridge is built. The only way you could remain competitive with a Home Depot in Transportationville would be to cut prices. That, unfortunately, would put you out of business.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?

- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to ensure that you stay in business and remain profitable.

6.3 Welcome *to* Transportationville, *USA*

Private Information/Hidden Agendas
Local School Principal
FOR THIS GROUP ONLY

You are the principal of Transportationville Elementary School. You are responsible for the education of Transportationville's young students. Over the past 20 years that you have been the principal, test scores and graduation rates have steadily increased. The number of students going on to attend college is at an all-time high.

Fifteen years ago Transportationville built a new elementary school to accommodate anticipated population growth. For the past several years, the population has grown faster than the projections. A surge in new students has already put pressure on school resources. Classes are full.

The old building had been situated right on the main road, and traffic had become a hazard for the students, with several near misses of children being struck by speeding cars. When the school switched buildings, a site was chosen that had little traffic, and was considered to be a lot safer.

You are concerned about the new bridge project for many reasons:

- The number of students on the other side of the river has been increasing rapidly over the past few years. It is becoming increasingly difficult to get those students to school on time. The new bridge promises better access to the other side of the river.
- An approach road and construction staging site are planned for an area adjacent to the school property. This raises a serious safety issue with many heavy construction vehicles on the roads surrounding the school.
- The noise from construction may also negatively impact students' ability to concentrate in class. In addition, detours and road closings may disrupt regular bus routes. This could mean delays requiring longer bus rides and students possibly arriving late for school.
- Once the bridge is built, there will be a significant increase in traffic volume around the school. This poses an ongoing safety threat for the students.

As you engage in a discussion about the bridge think about the following questions:

- Are you in favor of or opposed to the new bridge?
- What concessions would you demand or be willing to make?

Objective: Your main objective in this exercise is to provide an environment for the students which is safe and conducive to learning.

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Mayor

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Environmental Group

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Long-Time Resident

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

Grading Sheet For Developer

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

Grading Sheet For Ferry Operator

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Commuter

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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_____

Other Comments _____

_____

_____

Student	Individual Grade	Group Grade

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Local Business Owner

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

_____

_____

Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

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Student	Individual Grade	Group Grade

6.3 Welcome *to* Transportationville, *USA*

Grading Sheet For Local School Principal

Stance on New Bridge: ____ For ____ Against

Major Arguments _____

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Areas of Power in Negotiation _____

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Areas of Compromise _____

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Alliances _____

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Understanding of Roles and Issues _____

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Other Comments _____

_____

_____

Student	Individual Grade	Group Grade

7 Webography

7.1 Web Resources

2001 National Household Travel Survey
"Summary of Travel Trends"
http://nhts.ornl.gov/2001/pub/STT.pdf
Refer to Exercise(s) 4.1

Association for the Advancement of Retired Persons (AARP)
"Livable Communities: An Evaluation Guide"
http://www.aarp.org/research/housing-mobility/indliving/d18311_communities.html
Refer to Exercise(s) 5.2

American Public Transportation Association
"Milestones in U.S. Public Transportation History"
http://www.apta.com/research/stats/history/mileston.cfm
Refer to Exercise(s) 4.1, 4.2

Architecture Week
"A More Sustainable Urban Environment"
http://www.architectureweek.com/2002/0821/environment_2-1.html
Refer to Exercise(s) 5.2

Delaware Valley Regional Planning Commission
Main Web site for the Central Jersey Metropolitan Planning Organization.
http://www.dvrpc.org/
Refer to Exercise(s) 6.3

Related links
http://www.dvrpc.org/hotlinks.htm
Refer to Exercise(s) 6.3

EH.net
"What Is Its Relative Value in U.S. Dollars?"
http://eh.net/hmit/compare/
Refer to Exercise(s) 4.2

Environmental Protection Agency
"EPA Student Center"
Intended for students in grades 5-8.
http://www.epa.gov/students/
Refer to Exercise(s) 5.1, 6.1

"How Ground-level Ozone Affects the Way We Live & Breathe"
http://www.epa.gov/air/urbanair/ozone/
Refer to Exercise(s) 4.1, 5.1

7.1 Web Resources

"Teaching Center"
http://www.epa.gov/teachers/
Refer to Exercise(s) 6.1

"Terms of Environment: Glossary, Abbreviations and Acronyms"
Commonly used environmental terms defined in non-technical language.
http://www.epa.gov/OCEPAterms/aterms.html
Refer to Exercise(s) 5.1, 6.1

Federal Highway Administration

"Focus on Congestion"
http://www.fhwa.dot.gov/congestion/
Refer to Exercise(s) 5.1

"Planning, Environment, & Realty (HEP)"
http://www.fhwa.dot.gov/environment/index.htm
Refer to Exercise(s) 5.2, 6.3

Google Maps

http://maps.google.com
Refer to Exercise(s) 4.1, 4.2

Grinning Planet

"Environmental Songs"
http://www.grinningplanet.com/6001/environmental-songs.htm
Refer to Exercise(s) 6.2

infoplease.com

http://www.infoplease.com/
Refer to Exercise(s) 4.2

It All Adds Up To Cleaner Air

http://www.italladdsup.gov
Refer to Exercise(s) 4.1, 5.1

Mapquest

http://www.mapquest.com/
Refer to Exercise(s) 4.1, 4.2

MP3.com

Songs available for purchase.
http://www.mp3.com
Refer to Exercise(s) 6.2

7.1 Web Resources

National Oceanic and Atmospheric Association (NOAA)
"Global Warming"
http://www.ncdc.noaa.gov/oa/climate/globalwarming.html
Refer to Exercise(s) 6.1

Natural Resources Defense Council
"Reference/Links"
http://www.nrdc.org/reference/
Refer to Exercise(s) 6.1

New Jersey Chapter of the American Planning Association
"Related Links"
http://www.njapa.org/links.html
Refer to Exercise(s) 5.2

New Jersey Department of Environmental Protection
http://www.state.nj.us/dep/
Refer to Exercise(s) 5.1, 6.1

New Jersey Department of Transportation
"Our Projects and the Environment"
http://www.state.nj.us/transportation/works/environment
Refer to Exercise(s) 6.3

"Publications"
http://www.njgov/transportation/publicat/
Refer to Exercise(s) 4.2, 4.3

New Jersey Future in Transportation (NJFIT)
"Case Studies: Evidence of Progress"
http://www.state.nj.us/transportation/works/njfit/case/
Refer to Exercise(s) 5.2

"Transit Village Initiative – Statewide"
Information on NJDOT's community development program.
http://www.state.nj.us/transportation/works/njfit/case/villages.shtm
Refer to Exercise(s) 5.2

7.1 Web Resources

"Transit Village Criteria"
http://www.state.nj.us/transportation/community/village/criteria.shtm
Refer to Exercise(s) 5.2

"Useful Links"
http://www.state.nj.us/transportation/works/njfit/links/
Refer to Exercise(s) 5.1, 6.3

New York Times

"Visit to the World's Fair of 2014"
Text of an article from 1964 by Isaac Asimov.
http://www.nytimes.com/books/97/03/23/lifetimes/asi-v-fair.html
Refer to Exercise(s) 4.3

NJ TRANSIT

Web site for New Jersey's public transportation corporation.
http://www.njtransit.com
Refer to Exercise(s) 4.1, 6.3

North Jersey Transportation Planning Authority

Main Web site for the North Jersey Metropolitan Planning Organization.
http://www.njtpa.org
Refer to Exercise(s) 6.3

"Additional Resources"
http://www.njtpa.org/links.htm
Refer to Exercise(s) 6.3

"Access and Mobility 2030: Regional Transportation Plan Update"
http://www.njtpa.org/planning/rtp2030/rtp2030.html
Refer to Exercise(s) 6.3

Nutrition.gov

http://www.nutrition.gov/
Refer to Exercise(s) 5.1

Pixelmatic

"Will Life Be Worth Living in 2000 A.D.?"
Text of an article from 1961.
http://www.pixelmatic.com.au/2000/
Refer to Exercise(s) 4.3

7.1 Web Resources

Popular Mechanics

"The Greatest Hits (And Misses) of Popular Mechanics"
Celebrates 100 years of futuristic predictions.
http://www.popularmechanics.com/science/time_machine/1288761.html?page=1&c=y
Refer to Exercise(s) 4.3

Rutgers, the State University of New Jersey

"Penns Neck Area Environmental Impact Statement (EIS) site"
www.policy.rutgers.edu/vtc/pennsneckareaeis/index.html
Refer to Exercise(s) 6.3

Sierra Club

"Community Transformation Examples"
Computer simulations that show hypothetical development improvements in communities.
http://www.sierraclub.com/sprawl/community/transformations/index.asp
Refer to Exercise(s) 5.2

"Sprawl Overview"
http://www.sierraclub.org/sprawl/overview/
Refer to Exercise(s) 5.2

Smithsonian Institute

"America on the Move"
A resource for transportation history.
http://americanhistory.si.edu/onthemove/
Refer to Exercise(s) 4.1, 4.2, 4.3

"Learning Resources"
http://americanhistory.si.edu/onthemove/learning/
Refer to Exercise(s) 4.1, 4.2, 4.3

"Yesterday's Tomorrows: Past Visions of the American Future"
Traveling exhibition that "explores the history of the future."
http://www.yesterdaystomorrows.org/about.html
Refer to Exercise(s) 4.3

Songs for Teaching

http://www.songsforteaching.com/environmentsongs.htm
Refer to Exercise(s) 6.2

South Jersey Transportation Planning Organization

Main Web site for the Southern New Jersey Metropolitan Planning Organization.
http://www.sjtpo.org/
Refer to Exercise(s) 6.3

7.1 Web Resources

Related Links
http://www.sjtpo.org/links2.html
Refer to Exercise(s) 6.3

2025 Regional Plan
http://www.sjtpo.org/rtp3.html
Refer to Exercise(s) 6.3

University of California Berkeley Library
"Transportation Futuristics"
Information and image galleries.
http://www.lib.berkeley.edu/news_events/exhibits/futuristics/
Refer to Exercise(s) 4.3

7.2 General Reference

American Planning Association
"Planning Acronyms and Abbreviations"
http://www.planning.org/resources-k/acronyms.htm

American Public Transportation Association
"Public Transportation Definitions"
Taken from the APTA *Public Transportation Fact Book.*
http://www.apta.com/research/info/define/

Federal Highway Administration
"Planning Glossary"
http://www.fhwa.dot.gov/Planning/glossary/

Federal Transit Administration
"Glossary of Transit Terms"
http://www.fta.dot.gov/31_ENG_HTML.htm

Urban Land Institute
http://www.uli.org

8

Glossary

8.1 Instructor Glossary

Acid Rain – The wet form of acid deposition, a complex chemical and atmospheric phenomenon that occurs when emissions of sulfur and nitrogen compounds and other substances are transformed by chemical processes in the atmosphere, often far from the original sources, and then deposited on earth in either wet or dry form. Acid rain can fall to earth as rain, snow, or fog. The dry forms are acidic gases or particulates. *(EPA Terms of Environment)*

Air Pollution – Toxic or radioactive gases or particulate matter introduced into the atmosphere, usually as a result of human activity. *(NRDC Glossary of Environmental Terms)*

Alternative Energy – Energy that is not popularly used and is usually environmentally sound, such as solar or wind energy. *(NRDC Glossary of Environmental Terms)*

Alternative Transportation – Modes of travel other than private cars, such as walking, bicycling, rollerblading, carpooling, and transit. *(NRDC Glossary of Environmental Terms)*

Aquifer – An underground geological formation, or group of formations, containing water. Are sources of groundwater for wells and springs. *(EPA Terms of Environment)*

Atmosphere – The 500 km thick layer of air surrounding the earth which supports the existence of all flora and fauna. *(NRDC Glossary of Environmental Terms)*

Bus – Rubber-tired vehicles operating on fixed routes and schedules on roadways. Types of buses include:

- **Express Bus Service** – speeds up longer trips, especially in major metropolitan areas during peak commuting hours, by operating long distances without stopping.
- **Limited-Stop Bus Service** – hybrid between local and express service, where the stops may be several blocks to a mile or more apart to speed up the trip.
- **Local Bus Service** – vehicles may stop every block or two along a route several miles long.
- **Shuttle Bus Service** – local bus service that is limited to a small geographic area or to short-distance trips.

(APTA Public Transportation Fact Book, FTA Glossary of Transit Terms)

Bus Rapid Transit (BRT) – A type of limited-stop service developed in the 1990s that relies on technology to help speed up the service. It can operate on exclusive transitways, high-occupancy-vehicle lanes, expressways, or ordinary streets. A BRT line combines intelligent transportation systems technology, priority for transit, rapid and convenient fare collection, and integration with land use policy in order to substantially upgrade bus system performance. *(APTA Public Transportation Fact Book)*

Climate Change – Sometimes used to refer to all forms of climatic inconsistency, but because the Earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, 'climate change' has been used synonymously with the term 'global warming'; scientists however, tend to use the term in the wider sense to also include natural changes in climate. Also referred to as global climate change. *(EPA Terms of Environment)*

Commuter Rail – Urban passenger train service for local short-distance travel operating between a central city and adjacent suburbs. For any given trip segment (i.e., distance between any two stations), over 50 percent of the average daily ridership travels on the train at least three times a week. *(FTA Glossary of Transit Terms)*

8.1 Instructor Glossary

Corridor – A broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways and transit route alignments. *(FHWA Planning Glossary)*

Ecosystem – The interacting system of a biological community and its non-living environmental surroundings. *(EPA Terms of Environment)*

Eminent Domain – A government's right to take private property for public use, usually with compensation to the owner. *(Webster's New College Dictionary)*

Environmental Impact Statement (EIS) – Report developed as part of the National Environmental Policy Act requirements, which details any adverse economic, social, and environmental effects of a proposed transportation project for which Federal funding is being sought. Adverse effects could include air, water, or noise pollution; destruction or disruption of natural resources; adverse employment effects; injurious displacement of people or businesses; or disruption of desirable community or regional growth. *(FHWA Planning Glossary)*

Environmentally Sensitive Area – An area of environmental importance having natural resources which if degraded may lead to significant adverse, social, economic, or ecological consequences. These could be areas in or adjacent to aquatic ecosystems, drinking water sources, unique or declining species habitat, and other similar sites. *(FHWA Planning Glossary)*

Environmental Justice – The fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development and enforcement of environmental laws, regulations, and policies. *(EPA Terms of Environment)*

Fauna – The total animal population that inhabits an area. *(NRDC Glossary of Environmental Terms)*

Flora – The total vegetation assemblage that inhabits an area. *(NRDC Glossary of Environmental Terms)*

Fossil Fuel – A fuel, such as coal, oil, and natural gas, produced by the decomposition of ancient (fossilized) plants and animals; compare to alternative energy. *(NRDC Glossary of Environmental Terms)*

Global Warming – An increase in the near surface temperature of the Earth. The term is most often used to refer to the warming predicted to occur as a result of increased emissions of greenhouse gases. *(EPA Terms of Environment)*

Greenhouse Effect – The warming of the Earth's atmosphere attributed to a buildup of carbon dioxide or other gases; some scientists think that this buildup allows the sun's rays to heat the Earth, while making the infra-red radiation atmosphere opaque to infra-red radiation, thereby preventing a counterbalancing loss of heat. *(EPA Terms of Environment)*

Greenhouse Gas – A gas, such as carbon dioxide or methane, which contributes to potential climate change. *(EPA Terms of Environment)*

Habitat – The place where a population (e.g., human, animal, plant, microorganism) lives and its surroundings, both living and non-living. *(EPA Terms of Environment)*

Heavy Rail – High-speed, passenger rail cars operating singly or in trains of two or more cars on fixed rails in separate rights-of-way from which all other vehicular and foot traffic are excluded. *(FTA*

8.1 Instructor Glossary

Glossary of Transit Terms)

Hydrological Cycle – Movement or exchange of water between the atmosphere and earth. *(EPA Terms of Environment)*

Impermeable – Not easily penetrated. The property of a material or soil that does not allow, or allows only with great difficulty, the movement or passage of water. *(EPA Terms of Environment)*

Intelligent Transportation Systems (ITS) – The application of advanced technologies to improve the efficiency and safety of transportation systems. *(FHWA Planning Glossary)*

Intermodal – The ability to connect, and the connections between, modes of transportation. *(FHWA Planning Glossary)*

Interstate – Limited access divided facility of at least four lanes designated by the Federal Highway Administration as part of the Interstate System. *(FHWA Planning Glossary)*

Intrastate – Travel within the same state. *(FHWA Planning Glossary)*

Jitney – Passenger cars or vans operating on fixed routes (sometimes with minor deviations) as demand warrants without fixed schedules or fixed stops. *(APTA Public Transportation Fact Book)*

Land Use – Refers to the manner in which portions of land or the structures on them are used, i.e., commercial, residential, retail, industrial, etc. *(FHWA Planning Glossary)*

Light Rail – A streetcar-type vehicle operated on city streets, semi-exclusive rights-of-way, or exclusive rights-of-way. Service may be provided by step-entry vehicles or by level boarding. *(FHWA Planning Glossary)*

Livable Community – A community that has affordable and appropriate housing, supportive community features and services, and adequate mobility options, which together facilitate personal independence and the engagement of residents in civic and social life. *(AARP)*

Long-Range Transportation Plan – A document resulting from a regional or statewide process of collaboration and consensus on a region's or state's transportation system. This document serves as the defining vision for the region's or state's transportation systems and services. In metropolitan areas, the plan indicates all of the transportation improvements scheduled for funding over the next 20 years. *(FHWA Planning Glossary)*

Metropolitan Planning Organization (MPO) – **1)** Regional policy body, required in urbanized areas with populations over 50,000, and designated by local officials and the governor of the state. Responsible in cooperation with the state and other transportation providers for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation. **2)** Formed in cooperation with the state, develops transportation plans and programs for the metropolitan area. *(FHWA Planning Glossary)*

Mode – A specific form of transportation, such as automobile, subway, bus, rail, or air. *(FHWA Planning Glossary)*

Monorail – Guided transit vehicles operating on or suspended from a single rail, beam, or tube. Monorail vehicles usually operate in trains. *(FTA Glossary of Transit Terms)*

8.1 Instructor Glossary

Mixed-Use Development – Developments with the following criteria: **1)** three or more revenue-producing uses that, in well-planning projects, are mutually supporting, **2)** significant physical and functional integration of project components, including uninterrupted pedestrian connections, and **3)** development in conformance with a coherent plan. *(Urban Land Institute)*

Multimodal – The availability of transportation options using different modes within a system or corridor. *(FHWA Planning Glossary)*

Non-Renewable Energy Sources – Energy sources that come out of the ground as liquids, gases and solids, and cannot be replenished in a short period of time. *(Energy Information Administration)*

Passenger Miles – The cumulative sum of the distances ridden by each passenger. *(APTA Public Transportation Fact Book)*

Permeability – The rate at which liquids pass through soil or other materials in a specified direction. *(EPA Terms of Environment)*

Public Hearing – A legally required public gathering for the express purpose of informing and soliciting input from interested individuals regarding transportation issues, the results of which become part of a formal record. *(FHWA Planning Glossary)*

Public Meeting – A public gathering for the express purpose of informing and soliciting input from interested individuals regarding transportation issues. *(FHWA Planning Glossary)*

Renewable Energy – Energy resources such as windpower or solar energy that can keep producing indefinitely without being depleted. *(NRDC Glossary of Environmental Terms)*

River – A large natural stream of water emptying into a large body of water, such as an ocean or lake, and usually fed along its course by converging tributaries. *(Webster's New College Dictionary)*

Runoff – Precipitation that the ground does not absorb and that ultimately reaches rivers, lakes, or oceans. *(NRDC Glossary of Environmental Terms)*

Rural – Of or relating to the country. *(Webster's New College Dictionary)*

Smart Growth – A set of policies and programs designed to protect, preserve, and economically develop established communities and valuable natural and cultural resources. *(FHWA Planning Glossary)*

Solar Energy – Energy derived from sunlight. *(NRDC Glossary of Environmental Terms)*

Sprawl – Urban form that connotatively depicts the movement of people from the central city to the suburbs. Concerns associated with sprawl include loss of farmland and open space due to low-density land development, increased public service costs, and environmental degradation as well as other concerns associated with transportation. *(FHWA Planning Glossary)*

Stakeholder – Person or group affected by a transportation plan, program, or project. Person or group believing that they are affected by a transportation plan, program, or project. Residents of affected geographical areas. *(FHWA Planning Glossary)*

Suburb – A usually residential area or community outlying a city. *(Webster's New College Dictionary)*

8.1 Instructor Glossary

Transportation Planning – A process that includes the public and considers land use, development, safety, and security. *(FHWA Planning, Environment, & Realty (HEP)*

Urban – Of, relating to, or constituting a city. *(Webster's New College Dictionary)*

Urban Planning – The science of managing and directing city growth. *(NRDC Glossary of Environmental Terms)*

Urban Renewal – Rehabilitation of slum neighborhoods in urban areas, as by replacement or renovation of substandard buildings and facilities. *(Webster's New College Dictionary)*

U.S. Department of Transportation – Establishes the nation's overall transportation policy. Under its umbrella there are ten administrations whose jurisdictions include highway planning, development and construction; urban mass transit; railroads; aviation; and the safety of waterways, ports, highways, and oil and gas pipelines. *(FHWA Planning Glossary)*

Wetlands – Land (marshes or swamps) saturated with water constantly or recurrently. *(NRDC Glossary of Environmental Terms)*

Wildlife – Animals living in the wilderness without human intervention. *(NRDC Glossary of Environmental Terms)*

Windpower – Power or energy derived from the wind (via windmills, sails, etc.). *(NRDC Glossary of Environmental Terms)*

8.2 Student Glossary

Acid Rain – Emissions that are chemically transformed in the atmosphere and then fall back to earth in either wet or dry forms.

Air Pollution – Toxic gases, radioactive gases, or small particles sent into the atmosphere, usually due to human activities such as car and factory exhaust.

Alternative Energy – Energy that is not popularly used and is usually environmentally safe, such as solar or wind energy.

Alternative Transportation – Ways of traveling other than in private cars, such as walking, bicycling, rollerblading, carpooling, and public transportation.

Aquifer – An underground layer of rock or other material that contains water.

Atmosphere – The thick layer of air surrounding the earth that supports the existence of all plant and animal life.

Bus – Rubber-tired vehicles operating on roadways with specific routes and schedules. Types include:

- **Local Bus Service** – stops every block or two along a route several miles long.
- **Express Bus Service** – in major cities during rush hours, traveling long distances without stopping.
- **Limited-Stop Bus Service** – a combination of local and express service, where the stops may be several blocks to a mile or more apart to speed up the trip.
- **Shuttle Bus Service** – local bus service that is limited to a small geographic area or to short-distance trips.

Bus Rapid Transit (BRT) – A type of limited-stop bus service that relies on technology to speed up the service.

Climate Change – Sometimes a synonym for 'global warming', but also refers to natural, significant changes in the Earth's weather.

Commuter Rail – Train service that travels between a central city and nearby suburbs, with fifty percent of daily riders using the train at least three times a week.

Corridor – Any combination of streets, highways, and transit route alignments that are connected and feed into a broad geographic band.

Ecosystem – A biological community's interaction with its non-living surroundings.

Eminent Domain – A government's right to take private property for public use, usually with payment to the owner.

Environmental Impact Statement (EIS) – A required, written report for transportation projects that seek or receive money from the government, detailing potential negative effects on the environment.

Environmentally Sensitive Area – A location of natural resources that, if negatively affected, could have equally negative social, economic, or ecological consequences.

Environmental Justice – The fair treatment of people of all races, cultures, incomes, and educational levels in relation to environmental laws, regulations, and policies.

8.2 Student Glossary

Fauna – The total animal population that inhabits an area.

Flora – The total plant life that inhabits an area.

Fossil Fuel – Produced when ancient fossilized plants and animals decompose.

Global Warming – An increase in the near surface temperature (i.e., oceans and the atmosphere) of the Earth.

Greenhouse Effect – The warming of the Earth's atmosphere due to the buildup of carbon dioxide or other gases.

Greenhouse Gas – A gas, such as carbon dioxide or methane, which contributes to potential climate change.

Habitat – The place where a population (e.g., human, animal, plant, microorganism) lives, including its living and non-living surroundings.

Heavy Rail – High-speed passenger rail cars (such as commuter rail) that travel on fixed tracks where no pedestrain or car travel is allowed.

Hydrological Cycle – Movement or exchange of water between the atmosphere and earth.

Impermeable – A surface that water and other liquids have difficulty traveling through.

Intelligent Transportation Systems (ITS) – Using advanced technology to improve a transportation system's efficiency and safety.

Intermodal – The connections between different types of transportation.

Interstate – A highway with two directions and at least four lanes.

Intrastate – Travel within the same state.

Jitney – Passenger cars or vans operating on specific routes based on a population's need.

Land Use – The way in which portions of land or the structures on them are used for commercial, residential, retail, industrial, or other purposes.

Light Rail – A streetcar-type vehicle operated on city streets.

Livable Community – A community that has affordable and appropriate housing, supportive services, and enough transportation options for all residents.

Long-Range Transportation Plan – The defining vision for a region's or state's transportation systems and services, created from collaboration with the public.

Metropolitan Planning Organization (MPO) – Required for urban areas with more than 50,000 citizens, this organization carries out federal highway and transit laws and develops transportation plans and programs for its region.

Mode – A specific form of transportation, such as an automobile, subway, bus, train, or airplane.

Monorail – Transit vehicles operating on or suspended from a single rail, beam, or tube.

8.2 Student Glossary

Mixed-Use Development – Developments that are both profitable and supportive, have a significant mix of physical design and function, and follow a coherent plan.

Multimodal – The availability of different transportation options within a system or corridor.

Non-Renewable Energy Sources – Energy sources that come out of the ground as liquids, gases, and solids, and cannot be replenished in a short period of time, such as fossil fuels.

Passenger Miles – The sum of all distances ridden by a passenger.

Permeability – The rate at which liquids pass through soil or other materials in a specified direction.

Public Hearing – A legally required public gathering for informing and receiving input from interested individuals regarding transportation issues, the results of which become part of a formal record.

Public Meeting – A public gathering for informing and receiving input from interested individuals regarding transportation issues.

Renewable Energy – Energy resources that can't be used up, such as windpower or solar energy.

River – A large natural stream of water emptying into a large body of water.

Runoff – Precipitation that the ground does not absorb and that eventually reaches rivers, lakes, or oceans.

Rural – Of or relating to the country.

Smart Growth – Policies and programs designed to protect, preserve, and develop the economy of communities and their natural and cultural resources.

Solar Energy – Energy derived from sunlight.

Sprawl – The movement of people from a city to the suburbs, causing loss of farmland and open space, increased public service costs, and environmental ruin, as well as other concerns.

Stakeholder – A person or group affected by or believing that they are affected by a transportation plan, program, or project.

Suburb – A residential area or community just outside a city.

Transportation Planning – The inclusion of the public, land use, development, safety, and security when proposing new transportation projects.

Urban – Of or relating to a city.

Urban Planning – The science of managing and directing city growth.

Urban Renewal – The rehabilitation of slum neighborhoods in urban areas, usually by replacing or renovating substandard buildings and facilities.

U.S. Department of Transportation – Organization that establishes the nation's overall transportation policy.

8.2 Student Glossary

Wetlands – Land that is constantly or repeatedly filled with water, such as marshes or swamps.

Wildlife – Animals living habitats without human intervention.

Windpower – Power or energy derived from the wind (via windmills, sails, etc.).

Appendix

Answer Key

Answer Key

Chapter 4: The History of Transportation

4.1.A Out of class research on impact of vehicle emissions on the environment. (Section 4.1, Page 14) From US Environmental Protection Agency (EPA) Web site www.epa.gov

- Vehicle emissions contribute greatly to air pollution nationwide
- Vehicle emissions with effects on public health include:
  - Carbon Monoxide pollution which had adverse effects on humans such as visual impairment, headaches and reduced work capacity
  - Hydrocarbons can cause lung damage and cancer
  - Nitrogen oxides and particulate matter that have both public health and environmental effects
- Vehicle emissions also produce greenhouse gases which trap heat in the atmosphere and contribute to global warming. Greenhouse gases and climate change have a huge effect on the entire global ecosystem in addition to public health.

4.1.B Discuss what kind of emissions a car produces per minute of travel (Page 14)

Teachers can discuss with students what factors reduce or increase emissions per minute of travel:

Increase:
- SUVs or Large, Fuel inefficient vehicles
- Cars in need of filter changes or otherwise state of disrepair
- Going at faster speeds burns more fuel and releases more emissions

Decrease:
- Using a smaller, more fuel efficient car
- Keeping your car in good repair
- Going at 50-60 mph
- Using alternative fuel cars

4.1.C Find ways to reduce the environmental impact of their travel (Page 14)

- Use energy efficient cars
- Use public transportation
- Carpool

4.1.D Find ways to alter their travel patterns to reduce emissions (Page 14)

- Bike or walk for shorter trips
- Plan errands in one trip instead of going back and forth to and from home
- Plan trips to places like the mall or supermarket with friends to encourage carpooling
- Use public transportation where possible

4.1.E Students should share their Travel Journal and find out how people in previous generations traveled (See answer 4.1.F). (*Example answers*)

What new kinds of trips are made today that were not made thirty years ago (i.e., Blockbuster)?
- Internet Cafes
- Visiting a multiplex theater
- Nintendo World in New York City
- Organic food markets
- Working out at the gym

What kinds of trips are no longer made today?
- Milkman delivering milk to the door
- Horse and buggy
- Caravans over long distances

Do you see any difference in how previous generations traveled?

Present generations:
- Expected driver's license in high school
- High speed trains are more common
- Commercial airline flights are very common
- Use cars for all purposes instead of only leisure travel.
- Have cars for each member of household, where as previous generations had only one car for entire family.

Answer Key

Have students write a brief paper on how their travel behavior differs from that of previous (Page 15)

4.1.F Homework Activity- Travel Journal Discussion Guide (Page 17) (*Example answers*)

What did you learn from keeping the journal?

- Dependence on cars
- Don't have a public transportation system I can use
- How far I travel each day
- How long traveling to places takes

What, if anything, surprised you?

- How much my family drives
- Driving even short distances
- How little I walk or bike to places

What was the most heavily used form of transportation? What was the least?

- Should include one of the following: Car, Foot, Bike, Bus, Train

Why do you think some types of transportation are used more than others?

- Convenience
- Time
- Necessity (for public transportation)
- Social status

Comparing your travel behavior with that of the average U.S. citizen, what similarities and differences do you see?

Per 2001 travel survey, average citizen information:

- Makes the majority of trips in a private vehicle
- Makes an average of 4 trips per day
- Travels an average of 40 miles per day
- Spend around 70 minutes per day in a vehicle (for the ages 19-24)
- Likely travels alone to/from work but more likely with other people for other trip purposes (shopping, social or recreational)

How do you think travel behavior and patterns have changed over the years?

- More car use as people moved to suburbs
- Used to be SUVs, now "green" cars are in fashion
- What are some of the impacts of your travel behavior on the environment?
- Driving a lot and alone causes the most damage to the environment
- Taking public transportation helps the environment by using less emissions per passenger mile traveled
- Carpooling to sports' practices or other extracurricular activities helps reduce my impact on the environment
- Emissions cause problems like air and noise pollution that can result in health problems within my community and throughout the country

4.1.G Activity- Travel Journal Analysis, need answers for these in connection with table on page 18 (Page 20)

- Students should calculate each field based on their travel journal.
- Average speed can be calculated by distance/time.

4.1.H Using your data and the Web Resources, research the effects vehicle emissions from your travels are having on the environment. Your findings will be discussed in class. Pay particular attention to how and what kind of emissions a car produces per minute of travel. Once you've discovered the effects, come up with ways you can reduce the environmental impacts. How could you alter your travel pattern? (Page 22)

Ground-level ozones effects on the environment (from EPA site):

- Health irritations to the respiratory system including wheezing, asthma irritation and lung damage
- Interference with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather
- Damage to the leaves of trees and other plants, negatively impacting the appearance of urban vegetation, as well as vegetation in national parks and recreation areas

Answer Key

- Reduce forest growth and crop yields, potentially impacting species diversity in ecosystems

Solutions to mitigate impact (from It All Adds Up to Clean Air):

- Groups trips together "trip chain"
- Keep your car maintained so it stays as fuel efficient as possible
- Don't top off at the gas station and fill up when it is cool

4.1.I Using the Web Resources below and your family research, write a brief paper on how your travel behavior differs from that of previous generations. (Page 22)

- Encourage students to look at each of the resources and try to incorporate at least one interesting point from each resource
- Make sure they ask as many people from different generations as possibly in their families. If they have parents who are immigrants, have them ask what it was like traveling in their "home" country.

4.2.A This exercise will use students' knowledge of U.S. history and transportation, and will require some math and logic skills. Students must find out when and where an event occurred and figure out how they will get home and how long the trip will take. (Page 23)

Key for the (1) Boston Tea Party and the (2) Sacramento, CA Examples are included in the handbook.

- Emphasize research focused on how people were getting around. For example, the Model T top speed was 40-45 mph. It would more likely average 25 mph. Use that figure when calculating distance for that example.
- With the Lewis and Clark example, have students look at how long their expedition took and what routes they used.

3. Gadget is detonated in the first test of a nuclear weapon

Event name: Trinity
Location: White Sands Proving Ground, 35 miles southeast of Socorro, New Mexico
Date: July 16, 1945
Mode: Bus, car or horse, then train
Route: Socorro to Albuquerque, through Chicago and Pittsburgh to Newark
Not required answers, but details if the kids are interested:
35 miles northwest to Socorro, 79 miles north to Albuquerque
The Southwest Chief train from Albuquerque to Chicago 25 hours
The Capitol Limited train from Chicago to Pittsburgh (10 hours) and the Pennsylvania train from Pittsburgh to Newark (10 hours) or
The Cardinal Train from Chicago to Newark (26 hours)
Local train or streetcar to Hoboken
Distance: 2300 miles
Speed: approximately 60MPH
Travel time: 2 to 3 days
Cost: extra credit if students can find this!
Challenges: washed-out rails, train robbers, accidents

4. The first Ford Model T rolls off the assembly line

Location: Detroit, MI
Date: September 27, 1908
Mode: Passenger train
Route: Detroit through Pittsburgh to Newark
Distance: 720 miles
Speed: approximately 40MPH
Travel time: 1 day
Cost: extra credit if students can find this!
Challenges: washed-out rails, train robbers, accidents

5. Lewis and Clark return from their expedition to the Pacific Ocean

Location: Washington, DC
Date: Fall, 1806

Answer Key

Mode: Stagecoach or Sailboat
Route: King's Highway or Atlantic Ocean
Distance: 250 miles
Speed: app. 3 miles per hour
Travel time: 5-6 days
Cost: extra credit if students can find this!
Challenges: bandits, river crossings, rough seas

Resources:

- Lewis & Clark Expedition Timeline
  http://www.lewisclark.net/timeline/index.html
- Early American Roads & Trails
  http://freepages.genealogy.rootsweb.ancestry.com/~gentutor/trails.html#King

Write about 4 eras of Transportation including web names, names of eras, brief info on them and time period for each of those eras)

18th century
People traveled by both water and land. Coastlines were traveled via sailboats, and rivers – namely the Mississippi and Ohio Rivers – via smaller sailboats, rafts, and canoes. Roads were just being developed, with horse-drawn wagons, coaches, and carriages navigating Native American trails, some of which were being widened to become roads, such as the Boston Post Road, which having become a mail route between Boston and New York in 1673, was expanded to Charleston by 1750. In 1740, calls for a national road further spurred road development. Bicycles were also used to travel within cities.

19th century
This century saw many more transportation options. Firstly, steamships replaced sailing ships as the main form of marine transportation. Also, canals offered wider, more direct water transportation. In 1825, the Erie Canal opened, connecting the Great Lakes to the eastern seaboard. Lastly, U.S. passenger rail began in 1830, running transcontinental by 1869, and constituting 95% of intercity passenger trips by the turn of the century. Within cities, bicycles and horses were joined by streetcars, the first of which began in San Francisco in 1871.

20th century
This century saw the most progress yet in transportation modes and routes. Although the automobile was developed in the late 1800s, 1908 was a turning point in America with the development of the Ford Model T, making automobiles affordable to the average person. In 1912, the diesel ship was invented and soon replaced steam. In the 1920s, commercial aviation began, with the Air Commerce Act being passed in 1926. Passenger rail travel peaked in the 1920s and re-surged during WWII, but declined steadily as commercial aviation grew from the 1950s onward. Lastly, the 1956 Federal Aid Highway Act paved the way for intercity automobile travel. Within cities, although most municipalities had streetcars by the 1920s, they were replaced by buses in the 1950s.

Resources:

- Brief history of U.S. passenger rail history
  http://library.duke.edu/digitalcollections/adaccess/rails-history.html
- History of Flight: U.S. Centennial of Flight Commission
  http://www.centennialofflight.gov/essay_cat/8.htm
- History of Streetcars
  http://inventors.about.com/library/inventors/blstreetcars.htm
- 18th Century Transportation
  http://www.history1700s.com/articles/article1011.shtml

4.2.B Extensions
Letters and Diary Entries Activity
Rather than have the students write a traditional essay, writing a letter home or a diary entry detailing the trip could make this a more creative assignment.

- Teachers should encourage students to write about what they saw, what they would imagine the trip would feel like, what the weather would

Answer Key

be like on their travels and how it might affect their ability to get to their destination.

Activity for Higher Grade Levels
Have students answer the same questions as if the event happened today. Have the students explain the different transportation choices that are avail¬able today as well as the preferred mode of travel now, compared to the preferred mode of travel in the past, and why.

- Teachers should see how and when the students incorporate the use of trains, planes, buses and cars. Students should also be encouraged to figure out how many times a car would need to stop for gas and even compare costs of different travel modes.

Activity for Lower Grade Levels
Have students investigate only the historical event and try to determine what modes of travel were available to average citizens at the time.

- Boston Tea Party (1773): Horse and Buggy (or Wagon), Sail Boats
- Lewis and Clark (1803): : Horse and Buggy (or Wagon), Sail Boats, Canoe
- Sacramento (1869): Railroad, Steamboats, Horse and Buggy (or Wagon)
- Model T (1908): Bus, Railroad, Steamboat, Trolley car
- The Gadget (1945): Bus, Automobile, Train, Plane (limited)

4.2.C Spread the Word- Discussion Guide, write answers as per the event selected for K-10 (Page 26)

- The when and where should be standard for each of the examples.
- Focus on how different groups devised different trips and respective costs to their choices.
- Tell students that they should give a reference to where they found the information
- Make sure that students list some of the modes above (see 4.1.I).
- Focus on general time frames and costs. This is not supposed to be an exercise to the closest cent or day but rather to provide a perspective on how transportation has changed over time.

4.2.D Higher Grade Levels
Using the event you chose, answer the same questions (page 27) from your Spread the Word homework handout as though the event happened today. Explain the different transportation choices that are available today. What is the preferred mode of travel now, as opposed to back then? Why do you think this change has occurred? (Page 28)

- Cars and planes have largely become the preferred mode of travel.
- Trains can also be used to commute and for longer distances though planes are faster and typically cheaper than the train.
- People now make choices based on speed and convenience.
- Buses continue to be used as the cheapest form of transportation over long distances (Greyhound, etc.)

4.2.E Lower Grade Levels
Using the list below, pick one of the historical events. How could the people of that time period travel? Describe what was available to them. (Page 28)

- (See 4.1.I for answers)

4.3.A Visions of the Future Activity (Page 30)
Have students, research visions of transportation that are at least twenty years old and that provided a description of what transportation would look like in the future. Visions can be found in magazines, newspapers, books, movies, TV shows, lyrics, exhibitions, etc., and students can use the Web Resources for information and research as well. The only requirement is that the envisioned future must make reference to transportation and be for around the year 2000. See Page 36 for Homework Activity questions.

Answer Key

- Students should be encouraged to look at magazines such as National Geographic, use the internet to search for picture representations of these visions, and even ask family members for ideas they remember growing up.

4.3.B Visions of the Future Activity (continued) Distribute the attached discussion guide so students can prepare for an in-class discussion. (Page 31) See Visions of the Future- Discussion Guide – Homework Activity on Page 34.

- Students are responsible to research their vision and follow up as to whether or not the vision came true.
- Encourage discussion on topics such as why particular elements are currently in use and why others were NOT realized. Also ask students to reflect on any experiences outside of New Jersey and whether or not the vision might be present somewhere other than the United States.

4.3.C Research the types of transportation avail¬able during the time period you have been assigned. What advances were made? (Page 37)

- Students can do online research including the Web resources outlined for them.
- Encyclopedias and other reference books will also help to develop answers to these questions.

4.3.D The Past Meets the Future Activity. Split the students into groups and assign them one of the following time periods:

- 1850 – 1880
- 1880 – 1920
- 1920 – 1960
- 1960 – 2000

Using the school library and Web Resources, especially the documents "People: The Transportation Connection" and "A Special Look at New Jersey's Transportation System" on the NJDOT "Publications" web page, have each group do in-depth research on the types of transportation available during that time period and what advances were made. At a minimum, students must discuss what new modes of transportation became available for the majority of the population. (Page 31)(See 4.1.M for answer)

4.3.E This activity will give you an opportunity to investigate some new technologies that experts are actually working on today. You may see many of these developed and deployed in your lifetime, and some of them have the potential to profoundly impact the transportation choices you have in the future. Your assignment is to pick one of the topics.

Below (or decide upon a separate topic with your instructor), answer the following questions, and present your findings to the class. (Page 37)

- Again, encourage students to use the internet to answer the questions regarding each technology.
- Students should also be directed to the Smithsonian Web site and other national organizations such as the National Science Foundation (www.nsf.gov)
- Encourage them to use logic to think about positive and negative impacts as well as barriers to implementation and development.

4.3.F Now it is time for you to develop your own vision of future transportation and create a completely new technology, a new application of current technology, or a radical modification of existing technology. See questions on page 38 table. (Page 38)

- To help students develop their new technology, feel free to ask them questions like:
- Is the technology to better move one person or family or lots of people?
- How does the technology move?
- What is its purpose?
- Ask students to not only think of vehicles but to think of other technologies that complement vehicles that can also help improve transportation
- How safe is the technology?

Answer Key

Chapter 5 Transportation and Public Health

5.1.A Students will be given instructions on how to create a season-specific "Transportation and Public Health" brochure either at home or in class. Give one or two sample brochure to teachers. The Homework Handout on page 43 is a guide for making this brochure. (Page 40).

- Teachers should check to make sure each student addresses issues of activity and inactivity

Students should be encouraged to be creative and think of fun ways to explain points (jokes, comic strip, etc.)

Public health brochures:

- University of South Florida College of Public Health Fundraising Priorities: http://usfweb3.usf.edu/unstoppable/cmsdocuments/Public_Health.pdf
- Cell phones and radio frequency: http://www.pueblo.gsa.gov/cic_text/health/cellphones/cellphones.pdf
- Sunscreens and tanning: http://www.pueblo.gsa.gov/cic_text/health/sunscreens/sun.pdf
- The Road to a Healthy Life (English and Spanish): http://www.pueblo.gsa.gov/cic_text/health/roadtohealthylife/roadtohealthylife.pdf
- Allergies and Hay Fever: http://www.pueblo.gsa.gov/cic_text/health/allergies/allergy.pdf

More brochures available at the Federal Citizen Information Center:
http://www.pueblo.gsa.gov/results.tpl?id1=16&startat=1&--woSECTIONSdatarq=16&--SECTIONSword=ww

5.2.A Homework: Read "Sprawl Overview" and "Transit Village Initiative" articles found on Web-sites. Complete questions on homework handout, on page 47. (Page 45)

Sprawl

Urban sprawl is spread-out development, usually on previously uninhabited land on the exterior of an urban area, which is why sprawl communities are sometimes called "ex-urban". Characteristics of sprawl include decreased population density and a separation of land uses – residential, commercial, etc. For example, in an older urban area, different types of housing as well as commercial development are in walking distance of one another because they were developed before the automobile. But with sprawl, houses are in one area, stores in another, and religious and medical institutions in another. The only way of going between them is driving. The obvious result is an increased dependence on driving as well as greater trip distances due to the spread-out development, and greater trip time because of traffic. A less obvious consequence is increased risk of obesity due to spending travel time in a car rather than on foot. Additionally, the increased travel time due to sprawl takes away from time for grocery shopping and cooking, leading to reliance on take-out and fast food. Less free time also means less opportunity for exercise.

Sprawl communities are often characterized by uniformity:

- One use in an area – either residential or commercial
- One house design repeated
- One commercial building design ("strip malls")
- One mode of transportation (cars)
- One travel route (highways and cul-de-sacs)
- One time-period represented (because sprawl involves development built in the last 30 years at a fast pace)

A main physical characteristic of sprawl is cul-de-sacs (rounded streets) as opposed to through streets (streets that connect to one another with intersections). Cul-de-sacs mean that housing developments

Answer Key

don't connect to one-another, but they all connect to one main, wide street. This concentrates all travel to the main street, causing traffic. With through streets, there are many ways to get from A to B. This disperses traffic, making it less severe overall, and more evenly distributes wear and tear on the roads. Both of these effects lead to cost savings because the main roads used by cul-de-sac communities require more regular repair and widening. There are many ways of designing street layouts for cities. The gridiron plan, with streets running at right-angles to one another in the form of a grid, originated in ancient Greece and has been used extensively throughout history. Its most famous use was in the United States was in the 1811 grid plan for Manhattan, which was replicated in many U.S. cities. However, a through street plan need not be as rigid as the grid plan. For example, Washington DC consists of diagonal avenues on top of its grid, and older European cities such as Paris exhibit a more organic pattern. The important thing is to have streets continue and meet one another.

In addition to being better for traffic, through streets allow for multiple uses besides residential, as cul-de-sacs were designed solely for automobile access to homes. The New Jersey Department of Transportation's Complete Streets Policy seeks to make streets safer and more accessible for non-drivers including pedestrians, bicyclists, children, older citizens, and anyone else choosing to travel car free. These goals are not attainable in cul-de-sac communities. In short, cul-de-sac communities allow for a single use (residential) accessible by a single mode of transportation (cars), whereas through streets allow for multiple uses (residential, commercial, recreational) accessible by many modes of transportation.

Rehabilitating sprawled communities involves diversifying the built environment – mixing residential and commercial uses, building colors, sizes, and types. Doing so prevents the development
of future sprawl. This can be accomplished by:

1. Creating other transportation options besides cars – i.e. light rail, commuter rail, dedicated bus routes (bus-rapid transit) and street cars.
2. Bringing the built environment down to the pedestrian level rather than the car – make streets more narrow, widen sidewalks, plant trees, put in cross-walks.
3. Passing zoning resolutions which require buildings to be built at the street front, with parking either behind, underground, or in a parking garage.
4. Promoting and zoning for mixed-use development, which means having residential and commercial uses in the same building (i.e. commercial store front with apartments above) or simply having residential and commercial buildings in walking distance of one another.
5. Promoting many kinds of residential and commercial building types – i.e. detached single-family homes, townhouses, and apartment buildings for residential, and varying sizes of commercial space to accommodate different kinds of businesses – grocery stores, barber shops, etc. – as well as different sizes of business – big chains as well as independently owned stores.

Community Transformations

1. Using previous Community Transformations as examples, list five things you would change in the displayed town to halt sprawl and explain why.
Possible answers:

- Invest in the central business district – i.e. fix up buildings
- Plant trees
- Install cross-walks
- Introduce on-street parking
- Invest in clean public transportation
- Build mixed-use developments close to the sidewalks
- Build affordable housing close to transit and jobs
- Require developers to pay impact fees (which pay for city services like roads, power, and water)

2. How have your changes improved the health of

Answer Key

townspeople?
Possible answer:
People don't have to drive as much. They can park in a garage and accomplish several errands on foot. Some trips don't require driving at all, and people can bike or walk. This makes people more active and reduces the risk of obesity. Plus, less driving means less air pollution, which improves peoples' health as well.

3. How have your changes improved the town infrastructure?
Possible answer:
The transportation network has improved, and because people are taking the light rail or commuter trains, there is less strain on roads, bridges, etc.

4. How have your changes made an effort to halt suburban growth?
Possible answer:
The pre-existing areas have been improved, making them more attractive, so people are less eager to build or buy property in new developments on the fringe.

1. Is your town experiencing sprawl? If yes, give some examples.
Subjective response.

2. If yes, what could be done or is being done to combat it?
Subjective response.

3. If no, could your town experience sprawl? Why or why not? What can your town do to combat it?
Subjective response.

4. What can you do to make your community aware of sprawl?
Subjective response.

Transit Village Initiative

The Transit Village Initiative was developed to encourage transit-oriented development (TOD). Transit-oriented development means concentrating mixed-use (residential and commercial) development around a transit center with service from either or all of the following: rail, light rail, bus, or ferry. Putting housing and businesses within walking distance of the transit center aims to reduce car trips as well as revitalize the area around a station. By participating in the Transit Village Initiative, towns receive grants and other resources to help further their efforts. Sixteen NJ communities are currently designated as Transit Villages.

TOD can be an effective way of combating sprawl. It accomplishes several of the objectives for reducing sprawl.

1. Do some research to see if your town is a Transit Village. If it isn't, do you think your town could qualify? Why or why not?
If a town has some sort of transit center – rail, light rail, bus or ferry – it is possible for it to strive to become a transit village. If there is no central transit station – for example if only buses stop in the town, and at various places, the town would need to take steps to create a transit station or revive an old one so that the transit stops in single location.

2. If your town has not been designated a Transit Village, do you think becoming a Transit Village could help your town? Why or why not?
Subjective response.

3. If your town has been designated a Transit Village, do you think it has helped your community? Why or why not?
Subjective response.

4. What are the pros and cons to becoming a Transit village?
Pros- increased funding for transportation infrastructure and development
Cons – residents may feel funds should be spent on other initiatives

Answer Key

5. Do you believe this is an effective way to combat sprawl? Why or why not?
Subjective response.

5.2.B Answer questions on page 47 regarding sprawl of the town.

Some options provided on the Sierra Club Web site (www.sierraclub.org/sprawl/)are:

- Adding dedicated transit services such as light rail or bus rapid transit
- Adding trees to the street
- Using mixed-use development
- Widen sidewalks and cross walks
- Added landscaping
- Encourage development at corners and along street
- Using storefronts to create a street line that is pedestrian friendly and safe
- Street infrastructure (lamps, benches, etc.)

5.2.C Answer questions on page 48, Homework Handout.

Is your town experiencing sprawl? If yes, give some examples

- Low, single use buildings
- Strip malls
- Gated communities
- Single-story detached development
- Big box retail like Wal-Marts and Target Supercenters

If yes, what could be done or is being done to combat it?

- Transit Oriented Development around transportation hubs
- Support for new laws allowing mixed-use and higher density development

If no, could your town experience sprawl? Why or why now? How can you combat it?

- Possible lack of sprawl could be due to saturated development or living in an urban area (Newark, Princeton) where sprawl does not particularly apply

What can you do to make your community aware of sprawl?

- Become involved with community planning boards and organizations
- Start a student group to help promote sprawl awareness
- Transit Village answers depend on the responses of each individual

5.2.D Answer questions on page 49, Homework Extension Handout.

- Look at the pictures and make sure they exhibit signs of desolate, low-level development, uninviting roads and highways or locations that lack pedestrian and/or bike facilities.
- Encourage students to think of the various treatments discussed during the Community Transformations exercise

Chapter 6 Transportation and Ecosystem

6.1.A (Page 52) What is an Ecosystem? Activity This will involve short activities to discuss what an ecosystem is and explore how its components are connected. See page 55, Questions Handout, fill in the blanks for Link 1 to Link 12 on page 55.

Page 55 Handout: (Example answers)
Link 1: Animals and humans (fauna) release CO2 into the atmosphere.
Link 2: The atmosphere contains gases such as oxygen that fauna use to survive.
Link 3: Soil provides/ absorbs water that can be used by fauna
Link 4: Animals excrete waste in soil that helps provide fertilization to plants.
Link 5: Soil provides the support and home for flora to grow.

Answer Key

Link 6: Some plants decompose other plants and organisms and replenish soil with nutrients.
Link 7: Flora releases oxygen into the atmosphere through photosynthesis.
Link 8: Flora absorbs CO2 from the atmosphere during photosynthesis.
Link 9: The atmosphere releases water during precipitation which is absorbed by soil.
Link 10: Soil provides the home for plants which process gasses in the atmosphere.
Link 11: Flora process CO2 released by fauna.
Link 12: Many herbivores and omnivores consume flora for energy.

Page 56 Handout (Example answers)

Component 1: When humans use cars, the emissions release greenhouse gasses into the air causing problems like the greenhouse effect and global warming. This leads to changes in flora and fauna as climates begin to their natural habitats.

Component 2: Large scale agriculture needs advanced irrigation systems. Sometimes these systems change the natural flow of water and provide irrigation to large farms at the expense of draining water from the surrounding areas.

Component 3: Domesticated animals such as cows need large plots of land for grazing. Much of this land has been taken by deforestation, resulting in changes to natural habitats of forest-dwelling species. These species either have to migrate to other areas or die out because their homes are lost to farming needs.

Component 4: Land development covers natural soil with materials such as concrete foundations for buildings or asphalt for roads. These barriers do not allow the ground to absorb water and much water is not retained by the earth because it runs off into streams and oceans. This water might be needed to sustain the flora and fauna in the area.

6.1.B (Page 52) Renewable and Non-Renewable Energy Sources Activity
The instructor will brainstorm with the class a list of renewable and non-renewable energy sources. In pairs, using the handout, students should categorize the energy sources identified. See page 58, Renewable and Non-Renewable Energy Sources Handout, and fill in the table.

Page 58 Renewable and Non-Renewable Energy Sources Handout

Renewable Energy Sources (per Wikipedia- www.wikipedia.org)
- Water (tidal, rain)
- Solar
- Wind
- Biomass (wood burning)
- Geothermal energy (heat from within earth)

Non-Renewable Energy Sources (per Wikipedia)
- Fossil fuels (coal, petroleum, natural gas)
- Nuclear energy

6.1.C (Page 52) Impacts of Transportation Systems on an Ecosystem Activity
Using the handout to collate their notes, students will develop a list of annotated bullets to explain how a transportation system (from its construction to its operation) impacts each of the four general components of an ecosystem. Fill out Handout table on page 59.

6.1.D (Page 52) How Do Transportation Systems
Impact People and Society? Activity
The instructor will discuss with students both the positive and negative impacts of transportation systems on people and society. Answer questions on page 60, Homework Handout.

Page 59 Handout (Example answers)

Atmosphere:
- Individual cars contribute to the presence of greenhouse and other toxic gasses in the atmosphere.
- Public transportation systems are better for the environment because they lower the rate of

Answer Key

emissions per person since they can carry more people.
- Green and energy efficient cars can help reduce damage to the environment
- Bicycle lanes and sidewalks help promote travel within a system without resulting in an increase of emissions.

Soil:
- Soil is covered by paved highways and reduces the ability of soil to retain water and support plant and animal life.
- Transportation systems that support human development also come with land development which also covers up soil.
- Public transportation systems and ideas such as transit-oriented development help mitigate the negative effects on soil that large highways have by encouraging improvements like tree planting.

Flora:
- Flora is sometimes used to provide a barrier between large highways systems and nearby residential or human development.
- Flora is usually negatively impacted by a transportation system because it cannot flourish on pavement or infrastructure such as rail tracks.
- Flora is encouraged with proactive and environmentally sensitive transportation policies.

Fauna:
- Many animals have been adversely affected by human development and transportation systems. Deer, for example have lost their habitat in the Northeast and are now considered a danger to drivers and other users of the transportation system.
- Improvements to the transportation system now result in the disuse of animals for transportation uses (horse and buggy).

Human development supports the creation and maintenance of a transportation system. Humans are the users of the system as well as its builders and operators.

6.1.E (Page 60) Homework Handout: How Do Transportation Systems Impact People and Society?

Look through your local newspaper and identify two or three local transportation issues or planning projects that are affecting the surrounding ecosystem. For each issue or planning project identified, answer the questions on page 60.

6.2.A Fill out Let's Listen Handout on page 64 for at least one of the song out of two.

Song "Build" by Housemartins

Social:
- The social force for more: more building, more bricks, more development
- Community being told that building and more is best for them; they were encouraged and then trampled on "build us up and knocked us down"
- Make way for the new "in with suits and new recruits"

Environmental:
- Disregard for the environment: "down with sticks and up with bricks"
- Development of transportation: "build a road for us to cross"

Economic:
- Development is better:
- "they work so fast it makes you sick"
- "in with suits and new recruits"
- "Build us lots and lots and lots"

Song "Big Yellow Taxi" by Joni Mitchell

Social:
- People don't value things until they are gone
- Desire to save things only when they are about to be taken away

Environmental:
- Pesticides (DDT) are harmful to the environment, even though better for produce "spots on my apples"
- Can't replant what we pave "put'em in a tree museum"
- Cars degrade the environment and are the cause

for environmental degradation "paved paradise and put up a parking lot"

Economic:

- Cars and develop hurt the environment
- Honor through museums and money (charge people to see the trees that were destroyed)
- Replace the natural environment with development "pint hotel, a boutique and a swinging hot spot"
- People value perfect products over the natural environment (DDT used to make spotless apples while killing birds and the bees)

6.2.B Answer questions on page 67, Homework Handout for the same song that was selected for M6.

- Encourage students to find songs dealing with the environment, transportation, development, capitalism, conservation

6.2.C Answer questions on page 68, Homework Extension Handout for the same song that was selected for M6.

- Make sure students have the lyrics and write their essay on how these issues relate to the lesson.
- Any song dealing with the environment, transportation, or development can be connected to ideas of transportation and systems (such as the ecosystem)
- Check to make sure students have explored the interconnectedness of the ideas in their essays.

6.3.A (Pages 71 to 97) Welcome to Transportationville, USA: Grading Sheets

Teachers can let students know before the activity how they will be graded. In grading each individual for the exercise, some things to evaluate are:

- How well the individual maintained the parameters set in their respective "Top Secret" profiles.
- If the participant contributed to the dialogue and expressed their respective interests clearly
- Looked for opportunities to compromise or gain allies in convincing others to join a particular side or opinion
- Was able to ensure the group addressed all issues of concern regarding the proposed project

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