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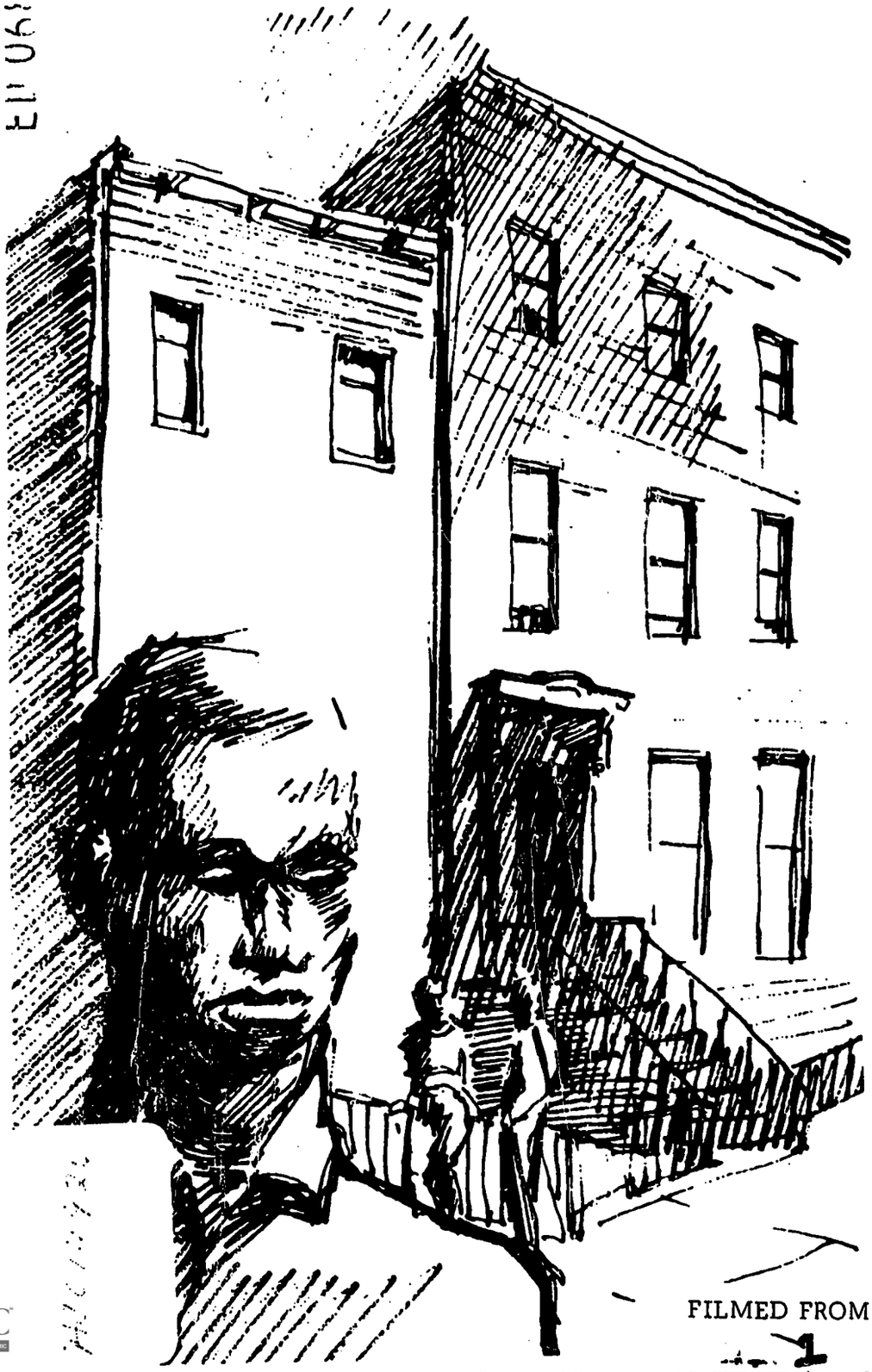
ABSTRACT

One of a series of modules for possible use as semester or part of semester course discusses problems in a complex public and private transportation system, and encourages proposed solutions. By means of three columns headed: Understandings; Suggested Pupil and Teacher Activities; Source, each page deals with one problem. A Method of Survey Appendix, offering suggestions for inexperienced teachers on effective use of community surveys is given. (NF)

The Consumer and Transportation

-one of a series for expanded program
CONSUMER EDUCATION



The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Secondary Curriculum Development
Albany, New York 12224
1972

THE UNIVERSITY OF THE STATE OF NEW YORK
THE STATE EDUCATION DEPARTMENT
ALBANY, NEW YORK 12224

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Gregory Benson, Jr.
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Enclosures

THE CONSUMER AND TRANSPORTATION

One of a series in Expanded Programs of Consumer Education

PRINTED THROUGH THE USE OF ESEA TITLE I FUNDS

The University of the State of New York/The State Education Department
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FOREWORD

In 1967, the State Education Department published "Consumer Education - Materials for an Elective Course." This material has since been introduced into more than 500 of the New York State high schools. As a result of the interest in Consumer Education in the State and Nation, the Department has been in the process of preparation and publication of a series of modules — Expanded Programs in Consumer Education. This unit, "The Consumer and Transportation," is the latest module to be produced.

Those modules in the series already published include:

Education and the Consumer
Consumer Issues and Action
The Consumer and Recreation
Consumer Problems of the Poor
The Consumer and His Health Dollar

Other modules still to be prepared will cover the following fields:

Beauty Products and the Consumer
The Consumer and His Tax Dollar
The Consumer Looks at His Automobile Insurance

Unlike the original syllabus, where 12 units covering various phases of Consumer Education were bound together, the modules in Expanded Programs of Consumer Education are being prepared as separate publications to provide greater flexibility. Each of the nine modules in the series may be used as a discrete unit, or with others in the series. The nine modules may be presented as a semester or part of a semester course, or presented in conjunction with the original syllabus which covers such areas as the purchase of food; shelter; appliances; automobiles; and a consideration of credit; money management; fraud, quackery, and deception; banking and savings; life and health insurance; security programs; and consumer law.

It is hoped that the presentation of the modules as separate publications will tend toward flexibility in their use as mini-courses in such fields as social studies, business education, home economics, industrial arts, and other areas of the curriculum.

The suggestions to the teacher found in "Consumer Education - Materials for an Elective Course," pages 1-4, apply equally to each of these modules.

The basic material for this module was developed and written by John U. Holmes, consumer education and social studies teacher at Hudson Falls Central High School. Hillis K. Idleman, associate in secondary curriculum development, revised the material and prepared it for publication.

The Department solicits the suggestions of those in the teaching field as to the nature of additional topics that should be covered in the consumer area.

Gordon E. Van Hooft
Director, Division of
School Supervision

ACKNOWLEDGMENTS

Appreciation is expressed to the following representatives of the New York State Department of Transportation for their critical review of this module and for the helpful additions and suggestions they made:

Robert Breuer, principal transportation analyst
Jude Crean, senior transportation management consultant
Donn Fichter, senior research analyst (transportation)
Carol Keck, research analyst (transportation)
William Lee, associate transportation analyst
E. T. Lynch, principal airport development specialist
Dale Meyers, senior motor carrier transportation specialist
Arthur Prentiss, associate rail transportation specialist

Although these Transportation Department representatives reviewed the material, it should not be assumed that in every instance their views coincide with the authors' views nor that the final document necessarily represents the official position of the Transportation Department.

We wish also to acknowledge the excellent cooperation of Miss Claire McCarthy, assistant to the public affairs director, Metropolitan Transportation Authority, who furnished material and photographs describing the work of that agency.

NEW YORK STATE
DEPARTMENT OF TRANSPORTATION

T. W. PARKER, Commissioner

1220 Washington Avenue, State Campus, Albany, New York 12226

JUL 3 1972

Mr. Hillis K. Idleman, Associate
Bureau of Secondary Curriculum Development
The University of the State of New York
The State Education Department
Albany, New York 12224

Dear Mr. Idleman:

I note with a great deal of interest the efforts of the Education Department in the field of consumer education in general and on the topic of transportation in particular. The Bureau of Secondary Curriculum Development merits good grades on its own for the publication The Consumer and Transportation which initiates a much needed curriculum in our secondary schools.

Transportation has always been a major consumer product, but only recently has it become a major national concern as we've come to recognize the defects and deficiencies in our transportation system. There are no ready answers on hand to solve transportation problems that face us. It will take the time, resources and energy of informed citizens who have an understanding of the complex issues involved.

The Consumer and Transportation identifies the major transportation problems we face and helps to pinpoint their causes so that they may receive consideration in an intelligent and rational manner. I'm hopeful that it will provide our young people with a better understanding of the transportation issues and challenges which lie before them as citizens of New York State.

Very truly yours,

R. T. Schuler

for T. W. PARKER
Commissioner

CONTENTS

C O N T E N T S (Con.)

INTRODUCTION

The problems of our transportation services are formidable. Congestion of traffic areas, pollution from the internal combustion engine, outmoded transportation systems and outmoded transportation concepts, inefficiency, archaic work practices in some elements of the transportation industry, lack of coordination of resources, changing shopping and employment locations — these are some of the problems which call for innovative concepts to close the mobility gap.

The term "millions on the move" symbolizes the transportation problem of the Nation. Not only are millions of people moving about by automobile, bus, train, and plane, but also countless tons of material are being moved by pipeline, truck, freight car, boat, or barge, as well as by air-freight. While each section of the country — rural, suburban, and urban — has its own unique transportation problems, a city such as New York epitomizes the most dramatic transportation issues.

In such a city, we find many people living on low income, set pension, welfare, Social Security, or disability allowance. Here, also, we find many of the unemployed and the lower income minority groups, all of whom depend heavily upon public transit systems for their mobility. As inflation has caused a decline in the purchasing power of the dollar, as transportation costs have increased, as urban services have declined, those persons at the lower levels of income have suffered more than the rest of society. The urban transportation problem affects all who work or move about the urban area, but it affects those at the lower economic levels to a greater degree than those in more favorable economic conditions. Those with limited financial resources cannot afford to use alternatives to public transportation. For these people, public transit is the major, and often the only, means of mobility.

Consider the responsibility of the New York City Metropolitan Transportation Authority (MTA). The MTA is directed to coordinate the transportation needs of a 4,000 square mile area, embracing the city's five boroughs and seven adjacent suburban counties. It must supervise the world's biggest subway system (720 miles of track, 7,000 passenger cars, 476 stations), the Nation's most traveled passenger railroad (The Long Island), 4,200 buses, two airports, the Penn Central's Harlem and Hudson divisions, the New Haven's and Erie-Lackawanna's commuter services in New York State, and scores of bridges and tunnels. Each weekday 8 million riders use the MTA's facilities, a number equivalent to the total population of Sweden.

What would happen if these transportation services were to falter for any considerable period of time? The food necessary to sustain the life of the 8 million city dwellers would not flow in, nor would the goods the city dwellers produce flow outward to the rest of the Nation. The fuel needed to propel buses, taxis, and automobiles, and to generate power would be shut off. Clothing, drugs, and other life-sustaining needs would be in scarce supply. Subways would grind to a halt. Perishable foods would rot at terminals. Fire, ambulance, and repair services would be paralyzed. Factories would shut down. Schools would be deserted. Patients could not

reach physicians. As with other elements of our complex technological society, the failure to function of one element, in this case transportation, could bring the Nation close to disaster.

Despite the presence of extensive and expensive transportation facilities in America, it is alarming to discover that, because of changes in our living patterns, work patterns, lack of coordinated planning, and inadequate financing, our transportation systems are no longer adequate and, in fact, are breaking down.

One reason why the transportation dilemma exists is the fact that urban areas have been unable to adjust to the changing conditions brought about by many factors, most important of which is the great increase in the number of automobiles. The older urban centers, with physical characteristics that were fixed in less mobile times, have been staggered by the impact of the astounding increase in the number of automobiles and their increased use for recreational, social, and work purposes. Compounding the problem has been the fact that transportation systems were laid out to service the central business district rather than in terms of a diffused pattern locating employment and shopping in a circumferential pattern around cities. Many suburban areas still consider themselves rural and have failed to make administrative and governmental changes which would enable them to put modern methods such as coordination, planning, and efficient management to work. Governmental subdivisions must approach the transportation problem using 20th century methods. Another reason for the growing transportation problem has been the failure of neighboring governmental units, suburban and otherwise, to admit that they have a responsibility to assist the cities in meeting the rising costs of improved transportation.

Despite their best efforts, many urban areas have been unable to meet the demands made upon them for services. As a result of the population shift, the more affluent are moving from the city to the suburbs and leaving the lower income minorities and older citizens to meet the financial demands of the metropolis. Yet, on a daily basis, those from the suburbs have come into the city, used the city facilities, demanded improved transportation, and turned their backs on the problems of the city at nightfall. The transportation problem is most acute in the urban areas, but it is, as well, a national problem.

Just as there is a trend for the middle and upper economic groups to move from the inner city to the suburbs, there is a counter-trend of movement from rural areas to the city. The growing rural-to-urban trend predictions are that by 1975 more than 75 percent of an estimated 230 million population will be concentrated in urban areas and their environs, with about 150 million people living and working in the three metropolitan corridors of "Bosnywash" (Boston, New York, and Washington), "Chipitt" (Chicago and Pittsburgh), and "Sansan" (San Francisco to San Diego). As a result of this concentration, coupled with our growing population, it is estimated that between 1967 and 1980 the total capacity of the transportation system must double, if demand continues at its current rate.

Transportation has become a national problem. Most cities are asking for help; the suburban areas are just realizing their problem; the rural areas have not yet awakened to the coming difficulties. Yet, the problem is here now and must be faced now if we are to hold any hope of finding solutions. The problem is not just the need for increased mobility. It is also the problem of air pollution; noise; traffic congestion; destruction of neighborhoods by freeways; inadequate transportation for the underprivileged, the aged, and the handicapped; frustrating and costly delays in transfer between modes of travel for passengers, baggage,and cargo; inefficiency; improved safety - all of these cry out for priority handling as part of the total transportation problem.

To some degree we are being choked by all the marvelous machines we have built to transport human beings and goods. Despite all the roads we have built, we have a growing need for more, since more and more cars and trucks are trying to move over the same roads at the same time. With the continuing demand for air travel, the skies over our air terminals are dangerously overcrowded. Even some of the once great railroad empires are in financial trouble. Movement within the cities during rush hour is slow and difficult. Transportation is vital to Americans; it is no wonder that speedy, efficient, inexpensive, and convenient transportation is a high priority in our civilization.

This module will deal with some of the kinds of transportation which are essential to modern life and with the problems raised by an intricate and complex transportation system. Some proposed solutions will be offered, but more important, the purpose will be to get consumers to think of these problems and to encourage them to propose solutions that meet not only their needs but are, as well, socially desirable for the rest of America.

The study of this module should help students to:

- identify the transportation problems confronting our society
- compare the opportunity cost of private transportation with public transportation (Opportunity cost is the cost of an item expressed in terms of what might have been obtained instead of what was obtained.)
- demonstrate that the protection of man's environment must be considered when finding solutions to transportation problems
- evaluate present transportation methods and suggest possible improvements
- differentiate between personal wants and public needs as related to transportation
- construct "models of thought" (suggested solutions) which might help solve our transportation problem
- establish priorities for helping to solve local transportation problems, bearing in mind other community needs
- educate family, friends, and neighbors to an understanding of the transportation problem
- support legislative and community action leading to improved transportation

TRANSPORTATION PROBLEMS

NOTE: FOR AN EXTENDED TREATMENT OF THE AUTOMOBILE AS A TRANSPORTATION RESOURCE, SEE *CONSUMER EDUCATION — MATERIALS FOR AN ELECTIVE COURSE*, BUREAU OF SECONDARY CURRICULUM DEVELOPMENT, NEW YORK STATE EDUCATION DEPARTMENT, 1968.

* * *

CORE THOUGHT

The complex American society, still growing in size, yet trying to remain mobile without changing its ideas of mobility, creates its own transportation problems.

* * *

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT IS THE TRANSPORTATION PROBLEM?		
. The ability of the Nation to move people and goods speedily and efficiently is becoming increasingly difficult.	. What forms of public transportation are available in your area? Are there bus lines, rail lines, air service, subways, or elevated lines? Make a map or secure maps showing what facilities are available.	. Contact the local transportation authority, the bus, railroad, or taxi company in your area for information.
	. How would you travel to the nearest city from your home? Why would you choose this mode of travel? — speed — economy — convenience — lack of alternative methods	. If available, obtain schedules of service from the transportation companies in your area.
	. How would you go from your home to your central business district, shopping center, your work, the theater, your church or school? Why would you use the travel modes chosen?	

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The problems of operating all forms of public transportation have reached crisis proportions.	. From your own experience or that of family or friends, give evidence of what the transportation problem is in your local area. Is it inadequate bus service? Is it unreliable rail service? Is it inadequate subway service? Is it an inadequate highway system or extensive traffic congestion? Is it a lack of air facilities?	. Contact the local transportation company, the Chamber of Commerce, the merchants' association, or commuters' organizations in your local area and ask them to give their opinion as to what the local transportation problem is.
. An extremely large suburban population is making demands upon the transportation services of the city.	. Is the problem one of too much traffic for too little space? . Is the problem one of finances? Are the transportation companies losing money? Are these companies private or public? How are the public companies financed? Have these companies received subsidies to balance their losses? . Should the suburbanite help pay for the costs of an improved urban transit system? . Has consideration been given to traffic and service patterns or is there a total lack of planning?	. Student observations from a street corner may be an excellent source of information. . Ask your local government officials what the financial picture is for local transit. . Owen, Wilfred, *The Metropolitan Transportation Problem*, The Brookings Institution, Washington, D.C., 1966, ch. I and III . *Crisis-Transportation*, Caterpillar Tractor Co., Peoria, Illinois 61602 (Many of the illustrations in this module were taken from this publication. It is recommended that a copy be obtained for the classroom.)

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHY IS THERE A GROWING DEMAND FOR PUBLIC TRANSPORTATION, BUT AN UNWILLINGNESS OF MANY INDIVIDUALS TO SUPPORT IT?		
. The automobile provides more convenient door-to-door service at the wish and whim of the individual than does public transportation. - Each individual likes to have the independence which a private motor vehicle provides. - The number of multicar families increases each year. - There is a growing market for motorcycles among young Americans.	. Take a poll of the classes studying this subject or of all students in the school. Include in the poll the following questions: How many families have no automobile? How many families have only one automobile? How many families have more than one registered motor vehicle? How many students have their own car, motorcycle, truck, jeep, etc.? Chart the results of this poll to illustrate motor vehicle ownership.	. Students in the school are major sources of information. Draw as much of the information as possible from the local level; the material will be more meaningful to the students.
. Those whose needs are reasonably served by personally owned automobiles or existing public facilities are often reluctant to assume the additional tax burden of providing further transportation resources.	. Survey each member of your family. List all trips each member made today. - origin and destination of trip - purpose - mode - cost (use 14¢ per mile for private car) - time of day trip was made - number of people in the car or group - availability of an auto for the trip What conclusions can be drawn from this data?	. Use an almanac for a comparison of auto registrations over the years, i.e., *Information Please* or *New York Times Encyclopedic Almanac.* . Farris, Martin T., and McElhiney, Paul T., *Modern Transportation: Selected Readings,* Houghton Mifflin Co., Boston, 1967, part IV

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. A growing shortage of space makes for a reluctance to commit additional land for new highways, airport expansion, and truck mail routes.	. How many of the students have traveled on a train, public bus, or airplane for short or long distances? Why did each use the mode chosen?	
. The public has become dissatisfied with many of the transportation systems because transportation fares have risen, while some forms of service have declined. - In some cases equipment is outdated, worn out, unsafe, dirty, and unreliable; but companies have been unable or unwilling to replace it. - In some cases railroad rights-of-way have not been maintained and have become unsafe. - Schedules have not always been maintained. - Vandalism has greatly increased. - Terminals are, in many cases, in high crime areas and are difficult to police adequately at reasonable cost. Concern for personal safety has discouraged people from using them.	. Make a chart showing different forms of transportation that are no longer available in your area. What happened to these modes of transportation? Did some of these cease to operate because better transportation methods were developed? — because of lack of public support? — for financial reasons? . Make a bulletin board display of pictures of past, present, and future modes of travel. The local library may be helpful in lending pictures of this type.	. The local historical society may have information on past forms of public transportation such as trolleys, railroads, ferryboats, etc. . In some cases, older members of the family or community may know why types of transportation formerly used are no longer available.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Those transportation systems that have maintained equipment and have provided good service are generally being supported by the public.	. Make a bulletin board illustrating public transportation that is available in your area today. Compare past, present, and future modes. This will provide an interesting display to stimulate interest in the transportation study.	. Most companies that serve your local area are glad to provide articles and pictures for a bulletin board.
	. Check *Yearbook of Railroad Facts* to find railroad revenue, passenger miles traveled, number of cars in service, and number of companies operating for the past 10 years. What do these figures show regarding the decline in use of this form of public transportation?	. *Yearbook of Railroad Facts,* Association of American Railroads, American Railroads Building, Washington, D.C. 20036
WHAT HAS BEEN THE RESULT OF THE DECLINE OF SOME FORMS OF PUBLIC TRANSPORTATION?		
. As passenger rail and water transportation has declined, the public has demanded more highways capable of handling more traffic at higher speeds.	. What new roads or streets have been built in your neighborhood because of increased demand or other reasons? What is the estimated cost of road building per mile in your local area? How many miles of roads and streets are there in your community?	. The local department of public works or highways or The New York State Department of Transportation, 1220 Washington Ave., Albany, New York 12226, can supply information on local road types and construction.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. In some instances the public has demanded that the Federal Government subsidize rail and bus lines for the benefit of consumers.	. Have your superintendent of highways or highway engineer speak to the class about the cost of road building and maintenance and the number of miles of new roads built. . Is the increasing use of the automobile, with demands for more highways, a result or the cause of the decline of public transportation? Debate this question.	. Contact your local governmental officers or the regional office of the New York State Department of Transportation.
. The 42,000 mile national system of interstate and defense highways, when completed, will carry 20 percent of all the Nation's traffic, yet the demand for still other highways persists. - Nearly 4 million miles of roads exist in the United States.	. Obtain a recent road map of New York State and observe the extent of the interstate highway system. . Compare a road map of today with older maps of 5 to 10 years ago. What change do you readily observe? Why do you think there is such a tremendous increase in the number of roads? . Obtain a map showing the entire interstate highway system in the United States. . Debate the question of whether there is the need for all the highways we have and also the need for more highways. Why do students believe we need more and better highways or why do they believe that we have enough?	. A local gasoline station can provide maps of your state and many neighboring states. . The Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 20590 . For the most current transportation information, write the Bureau of the Census, Suitland, Maryland 20233. Request *Census of Transportation.*

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		. *Rail Transit Review and Outlook,* Railway Age, January 11, 1971 (See the comments by Secretary Volpe.)
. Each year the number of automobiles in use in the United States increases. . There are more automobiles in the United States than in any other single country.	. Have the class draw charts to illustrate the number of cars produced for the past 10 years in the United States. What will be the effect of continued increased production of cars on highway use and traffic congestion?	. An almanac . *The United States Statistical Abstract,* the Bureau of the Census . Automobile Manufacturers Association
WHY HAVE SO MANY LOCAL TRANSPORTATION AUTHORITIES BEEN CREATED IN THE LAST FEW YEARS?		
. Many public transportation companies have been forced to cut back services while at the same time raising prices in an effort not to lose money. Some have ceased doing business because of financial problems or have required public funds to continue operation. Others have been absorbed by transportation authorities, regional or local.	. Have any transportation services been curtailed or discontinued in your area? Why? What has been the effect? What, if any, public funds have been granted to local transportation agencies to assist them in continued operation?	. The local transportation companies . Local newspapers . Local governmental agencies . New York State Department of Transportation . Urban Mass Transportation Administration, Department of Transportation, Washington, D.C. 20590 . State representatives from your area

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The Metropolitan Transportation Authority is a State agency charged with "the continuance, further development and improvement of commuter transportation and other services related thereto" within the metropolitan New York area as well as the development and implementation of "a unified mass transportation policy" for the area.	. What is a transportation authority? Why have such authorities been created? Study the Metropolitan Transportation Authority as an example.	. Obtain copies of legislation which defines the purposes of MTA: - ch. 324, Laws of 1965 - ch. 717, Laws of 1967 . Request: *The Annual Report* and other informational material from Metropolitan Transportation Authority, 1700 Broadway, New York, New York 10019
. Several transportation facilities and agencies are now under MTA jurisdiction, including railroads (Long Island railroad, Penn Central commuter services), rapid transit (New York City Transit Authority and Staten Island Rapid Transit Operating Authority), bus lines, toll bridges, and airports.		
. Other major transportation authorities in New York State include: - Niagara Frontier Transportation Authority, Buffalo, New York	. Look into work done by the transportation authority in your area or neighboring area.	. Contact the authority nearest you.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Rochester-Genesee Regional Transportation Authority, Rochester, New York - Capitol District Transportation Authority, Albany, New York - Central New York Regional Transportation Authority, Syracuse, New York		
. Many states and the Federal Government recognize the need for a central state department to be involved in all forms of transportation. The organization and function of these departments varies among the states.	. Study the organization and function of the New York State Department of Transportation. For comparison, try to develop the differences and similarities with other states.	. Contact the New York State Department of Transportation, 1220 Washington Ave., Albany, New York 12226.
HOW HAS THE GROWTH OF POPULATION AND THE DEVELOPMENT OF LARGE URBAN AREAS AFFECTED THE TRANSPORTATION PROBLEM?		
. Employment is still largely concentrated in the central business or industrial areas of the cities, while the homes of workers are increasingly dispersed throughout the region.	. Make a survey of residents of the local community. The survey should include as complete a cross section of the community as possible: - young citizens - older citizens - professional people - salaried workers - hourly workers	. Local residents who work elsewhere . Public transit officials . City planning director

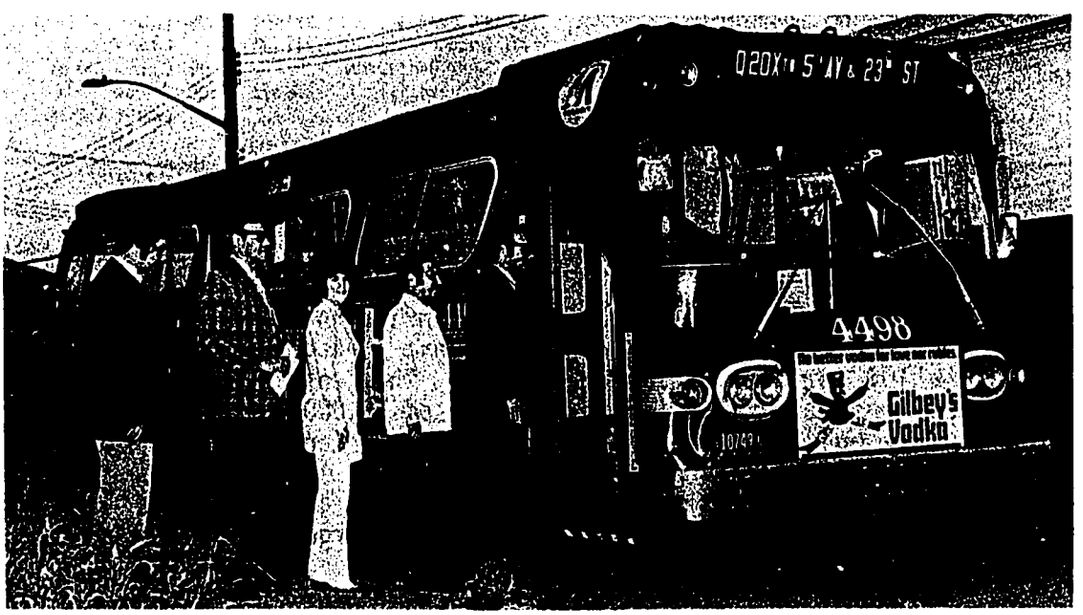
ILLUSTRATION I
Rail transportation serves commuters and city dwellers

Courtesy Metropolitan Transportation Authority

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. On an increasing scale, however, employment is becoming scattered throughout the urban and suburban areas, resulting in a two-way flow of commuters to jobs. . The older, one-way flow system of commuters to jobs in cities no longer meets the needs for the present commuter pattern. . Today's public transit systems are less adequate to serve this changed pattern than they were the former pattern.	Discover the number of people who live in the community, but work in a nearby city. How do they travel to work? What public transportation facilities are available? Would they use a public transit service if it were available? What is the distance traveled? How does the cost of private transportation compare with that of public transit? Do you see and recognize all the costs of such transportation? (See *Method of Survey*, Appendix A)	
. With many of those employed living in the greater urban areas, interest in, and support of, public transit is focused mainly on commuter travel to and from the central business or industrial area.	. Do you have people commuting into your community? A similar survey could be used to discover the people commuting to your area, but living in other areas.	. Contact local industries, unions, the Chamber of Commerce, or businessmen's organizations to supply information for the survey.
. Because comfort and personal convenience are such important factors, many urban commuters use automobiles instead of public transportation.	. In your survey, those using automobiles should be asked why they use this mode. How do those responding compare the use of the automobile to the use of public transit service? What incentives would be necessary to persuade	. *10 Super Cities - Home for 1 of Every 4 Americans*, U.S. News and World Report, August 2, 1971, p. 79 . See illustrations I and II.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	automobile users to switch to public transit service?	. Owen, Wilfred, *The Metropolitan Transportation Problem*, pp. 12-17
. The automobile is not always, and sometimes never, available for 25 percent of our population who do not drive: the young, the old, the sick, the poor. These groups constitute a sizable segment of the urban population. Much of the revenue for the support of public transit service comes from these groups.	. How many of the students have family members who have no car available? What do they do when transportation is needed? Do they call a taxi? — take a bus? — call a friend or other family member? — walk?	. Sobey, A.J. & Cone, J.W., *The Case for Personal Rapid Transit*, Highway Research Record #367 . Comments of Secretary of Transportation Volpe, *1970 New York Times Encyclopedic Almanac*, p. 666 . Current report: Transportation Trends, Marketing at a Crossroads #26: *Transportation Amid Social Change and Crisis*, American Trucking Associations, Inc., 1616 P Street N.W., Washington, D.C. 20036

ILLUSTRATION Ia



Courtesy Metropolitan Transportation Authority

ILLUSTRATION II

THE 100 LARGEST URBANIZED AREAS *

From final U.S. census count—

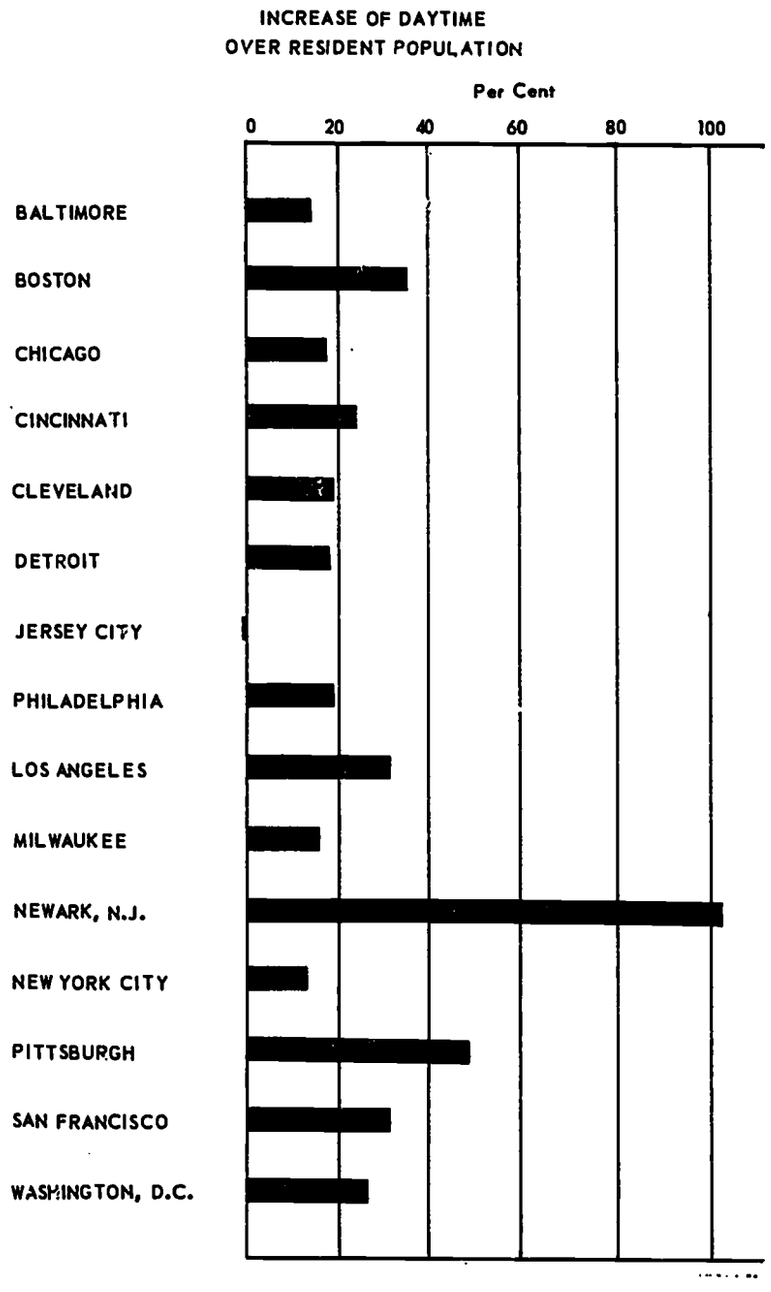
Urbanized Area	Population
1. New York-northeastern New Jersey	16,206,841
2. Los Angeles-Long Beach	8,351,266
3. Chicago-northwestern Indiana	6,714,578
4. Philadelphia-nearby New Jersey	4,021,066
5. Detroit	3,970,584
6. San Francisco-Oakland	2,987,850
7. Boston	2,652,575
8. Washington, D.C.-nearby Maryland, Virginia	2,481,489
9. Cleveland	1,959,880
10. St. Louis, Mo.-nearby Illinois	1,882,944
11. Pittsburgh	1,846,042
12. Minneapolis-St. Paul	1,704,423
13. Houston	1,677,863
14. Baltimore	1,579,781
15. Dallas	1,338,684
16. Milwaukee	1,252,457
17. Seattle-Everett	1,238,107
18. Miami	1,219,661
19. San Diego	1,198,323
20. Atlanta	1,172,778
21. Cincinnati, Ohio-nearby Kentucky	1,110,514
22. Kansas City, Mo.-Kans.	1,101,787
23. Buffalo	1,086,594
24. Denver	1,047,311
25. San Jose	1,025,273
26. New Orleans	961,728
27. Phoenix	863,357
28. Portland, Oreg.-nearby Washington	824,926
29. Indianapolis	820,259
30. Providence-Pawtucket-Warwick, R.I.	795,311
31. Columbus, Ohio	790,019
32. San Antonio	772,513
33. Louisville-nearby Indiana	739,396
34. Dayton	685,942
35. Fort Worth	676,944
36. Norfolk-Portsmouth	668,259
37. Memphis-nearby Mississippi	663,976
38. Sacramento	633,732
39. Fort Lauderdale-Hollywood, Fla.	613,797
40. Rochester, N.Y.	601,361
41. San Bernardino-Riverside	583,597
42. Oklahoma City	579,788
43. Birmingham	558,099
44. Akron	542,775
45. Jacksonville	529,585
46. Springfield-Chicopee-Holyoke-nearby Connecticut	514,308
47. St. Petersburg	495,159
48. Omaha-nearby Iowa	491,776
49. Toledo-nearby Michigan	487,789
50. Albany-Schenectady-Troy	486,525
51. Salt Lake City	479,342
52. Hartford	465,001
53. Nashville-Davidson	448,444
54. Honolulu	442,397
55. Richmond, Va.	416,563
56. Bridgeport	413,366
57. Youngstown-Warren	395,540
58. Syracuse	376,169
59. Tulsa	371,499
60. Wilmington, Del.-nearby New Jersey	371,267
61. Tampa	368,742
62. Allentown-Bethlehem-Easton-nearby New Jersey	363,517
63. Grand Rapids	352,703
64. New Haven	348,341
65. El Paso	337,471
66. Tacoma	332,521
67. Flint	330,128
68. Orlando	305,479
69. Wichita	302,334
70. Albuquerque	297,451
71. Tucson	294,184
72. South Bend-nearby Michigan	288,572
73. West Palm Beach	287,561
74. Charlotte	279,530
75. Trenton-nearby Pennsylvania	274,148
76. Newport News-Hampton	268,263
77. Davenport-Rock Island-Moline	266,119
78. Austin	264,499
79. Fresno	262,908
80. Mobile	257,816
81. Des Moines	255,824
82. Baton Rouge	249,463
83. Worcester	247,416
84. Peoria	247,121
85. Oxnard-Ventura-Thousand Oaks	244,653
86. Canton, Ohio	244,279
87. Columbia, S.C.	241,781
88. Harrisburg	240,751
89. Las Vegas	236,681
90. Shreveport	234,564
91. Aurora-Elgin, Ill.	232,917
92. Spokane	229,620
93. Lansing	229,518
94. Charleston, S.C.	228,399
95. Fort Wayne	225,184
96. Chattanooga-nearby Georgia	223,580
97. Wilkes-Barre	222,830
98. Little Rock-North Little Rock	222,616
99. Corpus Christi	212,820
100. Columbus, Ga.-nearby Alabama	208,616

About 25 percent of the United States population lives in 10 "super cities." About 35 percent is in the 25 largest areas. Listed above are the country's 100 largest "urbanized areas." The Census Bureau defines an "urbanized area" as consisting of "a city of 50,000 persons or more, plus the densely built-up adjoining area whether incorporated or not."

Census and other population experts see bigger and bigger cities developing in the future and the problems of the large urbanized areas growing as the cities grow.

*U.S. NEWS & WORLD REPORT, August 2, 1971, page 79.

ILLUSTRATION III

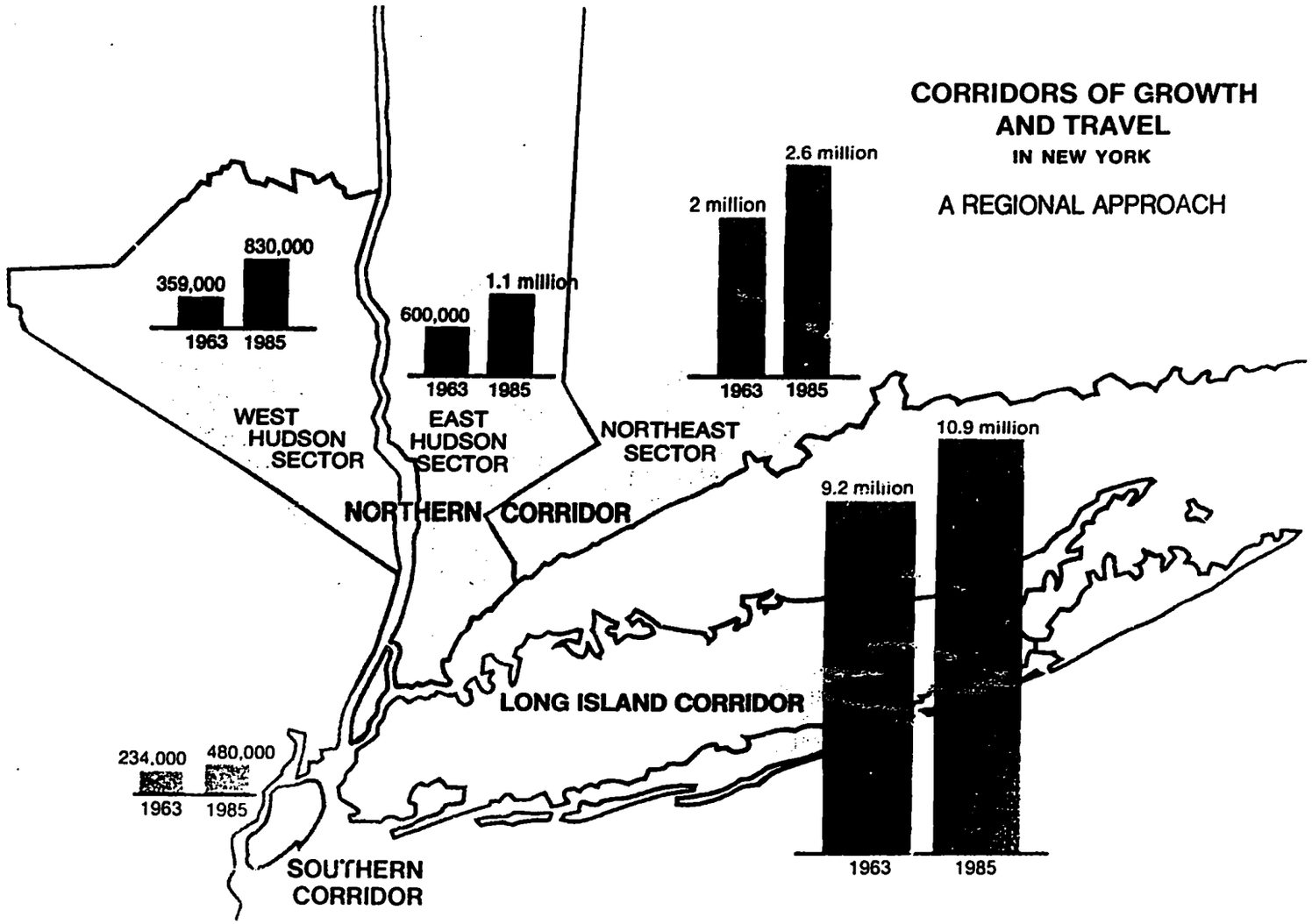


This illustration shows the percentage of people traveling into the city to work, to shop, or for business, then leaving at night. These people demand and use the services of the city.

*Wilfred, Owen. *The Metropolitan Transportation Problem.* The Brookings Institute, Washington, D.C. 1966

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
MUST TRANSPORTATION PROBLEMS BE APPROACHED ON A REGIONAL OR AREA-WIDE BASIS?		
. Some transportation authorities believe that no satisfactory solution to transportation problems can be found without using an integrated, multimodal approach to transportation. . Other transportation experts believe that not until some crisis arises, such as a monumental air pollution emergency or the curtailment of our gasoline supplies, will we be moved to take responsible steps to solve the transportation problem.	. What are the transportation needs of your regional area? Get the class to give their opinions and then, using a representative of area government and a representative of area business and industry, compare the opinion of the class and the thinking of your area representatives. Can the area needs be solved on a local basis? Why or why not?	. Local officials and local business people are usually willing to assist in such classroom activities to discuss vital issues.
. Although technological changes in our society permit the erasing of political boundaries in order to provide improved transportation, customs are difficult to change.	. What customs, practices, or circumstances exist in your area that you feel hinder proper development of a transportation system: - intercommunity jealousy? - intercommunity competitiveness? - economic problems? - geographic problems?	. Students should be encouraged to express their opinion and to feel free to make comments about local transportation.

ILLUSTRATION IV



Metropolitan Transportation Authority

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Each region must approach its transportation problem based on its own peculiar needs and the needs of those to be served, yet, hopefully, recognizing the problems of the Nation as a whole.	. What special transportation needs are required in your area: - all-weather transportation in snow areas? - low cost transportation to serve a large retired population or economically depressed area? - special needs of a large metropolitan area or small metropolitan area? - unique needs of a rural area? What makes these needs peculiar to your area?	. Contact labor organizations, industry, the Chamber of Commerce, hospitals, nursing homes, retirement homes, and schools in your area to find out what the peculiar transportation needs are.
	. Invite a speaker from a local or regional transportation authority, from a governmental transportation study committee, or a representative from a consulting engineering firm to express his professional thinking on regional transportation.	. Proposals for regional transportation systems are available from agencies involved in transportation, such as: - Metropolitan Transportation Authority, New York City - Tri-State Regional Planning Commission (formerly Tri-State Transportation Commission), 100 Church Street, New York, New York 10007, or the transportation authority nearest to your area

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		- United Transportation Union, 15401 Detroit Ave., Lakewood, Ohio 44107. Request the latest report of *The Conference on Mass Transportation.* . Owen, Wilfred, *The Transportation Problem,* ch. VI, pp. 165-187
. Planning is essential if a responsible and efficient program is to be developed.	. Has there been a transportation plan developed for your area: - for roads? - for transit? - for all modes of travel? - for your individual community? - for your region? . Who developed the plan? . What does the plan propose? . What are the projected costs of this plan? . What do you think of the plan? Why? . What do others in the class or community think of it? Why?	. New York State Department of Transportation, Planning and Research Bureau, Albany . Regional Office of NYSDOT . Local governmental officials . Local library . Regional planning agencies

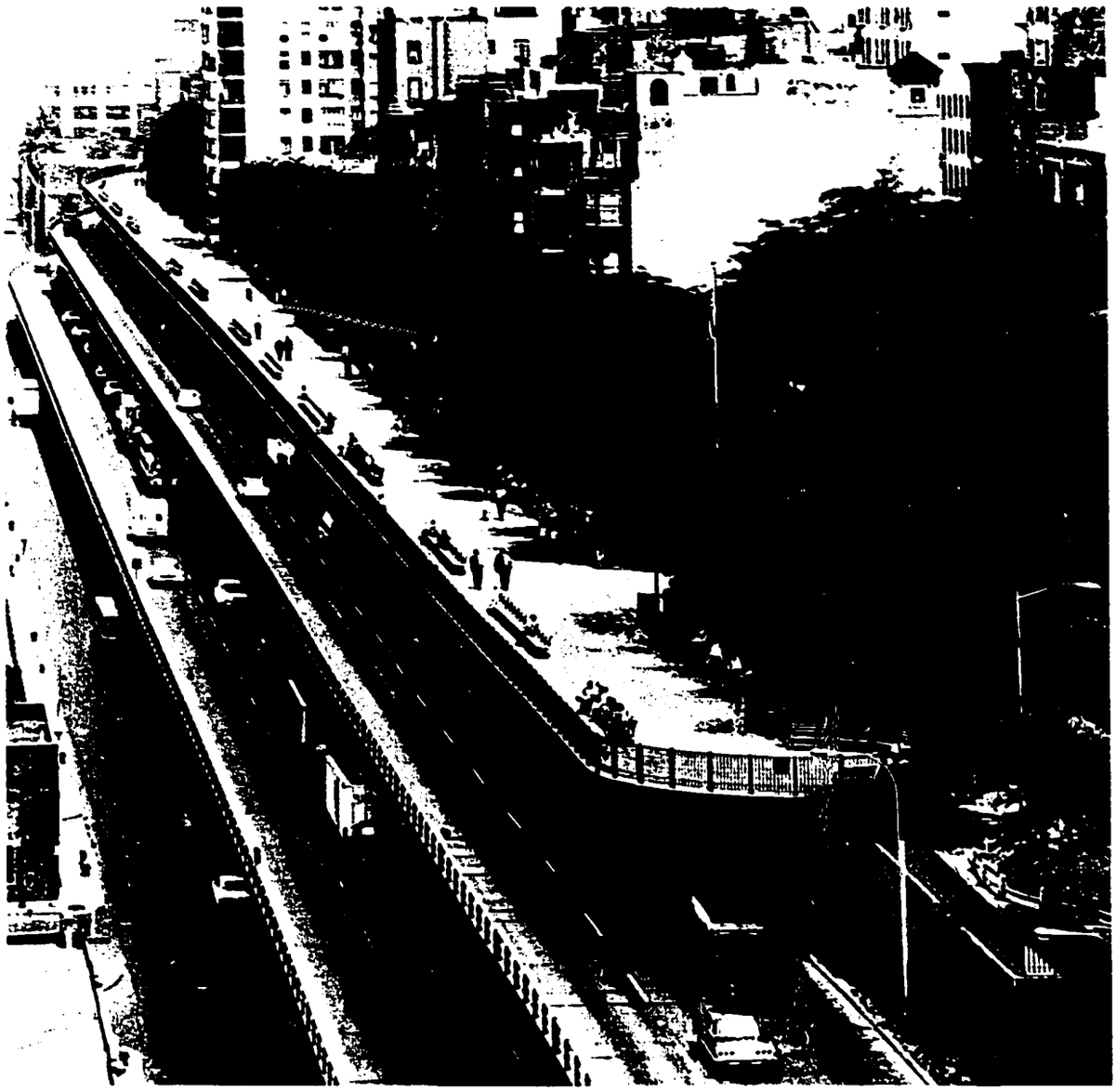
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. A more adequate and efficient transit system may be achieved by the regional approach, but this transit system may not be considered convenient by many people. The public must consider which is more important, personal convenience or an adequate transit system.	. What would your choice be in the following situations: - use public transportation or drive to work? Why? - ride the school bus, walk, ride a bicycle, or drive to school? Why? - spend money for a public transit system, or build parking lots, garages, and arterial highways to handle the auto traffic? Why? Center a discussion of personal wants and convenience vs. public needs and adequate transportation around these and other related questions.	. In many of the more developed countries of the world, the people own fewer autos than the people of the United States. They are less familiar with the "on the spot" type of transportation which our cars provide us and they thus depend on public transportation. With good public transportation, these people have less "need" for individual private transportation.
WHY MUST THE EFFECT UPON THE ENVIRONMENT BE CONSIDERED WHEN ATTEMPTING TO SOLVE THE TRANSPORTATION PROBLEM?		
. Man will not survive unless the environment which supports his life is fit to live in.	. If your science department is equipped to do so, take air samples along a busy street or main route in your locality. Test each sample for the amount of pollution. What do these sample test results show?	. Check with your earth science teacher or your science department chairman to obtain help in taking the air sample and testing it.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The transportation systems used must not unduly mar the land or pollute the air and water.	. Under the new programs concerning the environment, what efforts are being made by the government which affect your area? - antipollution devices on motor vehicles - designing of new highways to protect natural resources - designing of new airport runways to protect swamps, forests, and the like	. Environmental Protection Agency, 1129 20th Street, N.W., Washington, D.C. 20460 . Assistant Secretary for Environment and Urban Systems, Department of Transportation, Washington, D.C. 20590
	. Find out the number of miles of highways in your locality. Do all of the highways seem necessary? Was there an alternative to their construction?	. Contact the local highway superintendent to find out the number of miles of highways in your locality. . Contact various conservation organizations such as the National Wildlife Federation or the Sierra Club to find out what they are doing to encourage better transportation planning.
. Land usage must be made more efficient. - In large urban areas land is at a premium and consideration must be given to getting the greatest usage out of the available space.	. As changes in transportation have occurred in your local region, what consideration have the planners made for the environment, efficient use of land, pollution, disruption of neighborhoods, parking, traffic flow, and alternate transportation modes?	. New York State Department of Environmental Conservation, Albany, New York 12207 . New York State Department of Transportation, State Campus, Albany

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Significant amounts of street land are given to curb parking. Better traffic flow can be obtained if on-street parking is eliminated.		
- Methods such as stacking of highways, multimodal usage of land, and terminals serving more than one mode of transportation might provide better land use.	. Ask a representative of of the State Department of Transportation, local governmental representative, or an official from an area environmental agency to speak to the class about transportation planning and the environment.	. See illustrations V, VI, and VII.
- Transportation terminals should be planned to facilitate their use by both intercity and intracity transportation systems, thus achieving improved efficiency.		

ILLUSTRATION V

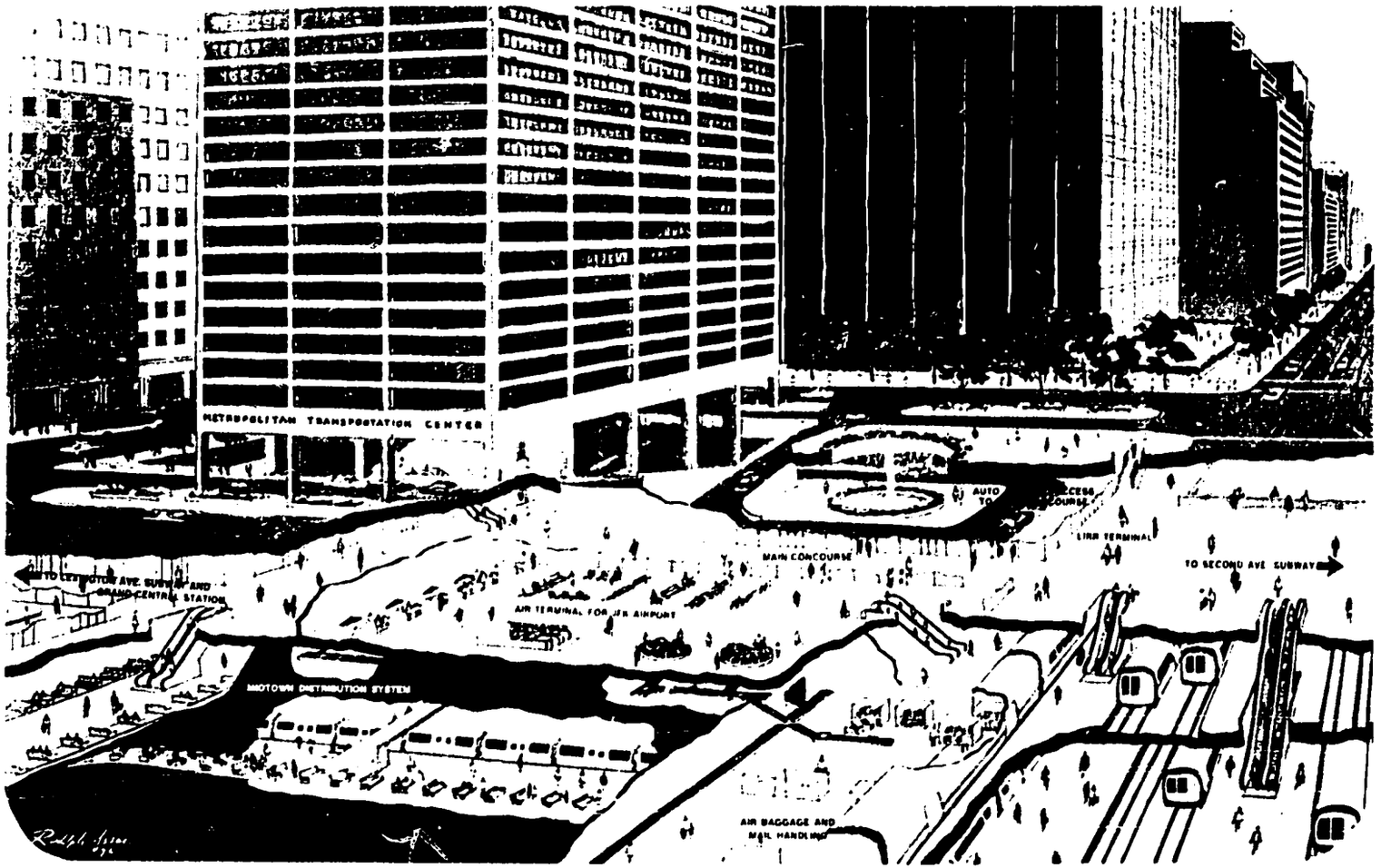
Efficient land usage



"68-88 - New York - The Brooklyn-Queens Connecting Highway at Columbia Heights. No extra land in addition to the freeway right-of-way had to be bought to create the promenade in Brooklyn—and the right-of-way for the freeway itself is only 50 feet wider than the old street over which the entire structure is set." (Photographer: David Plowden)

United States Department of Transportation

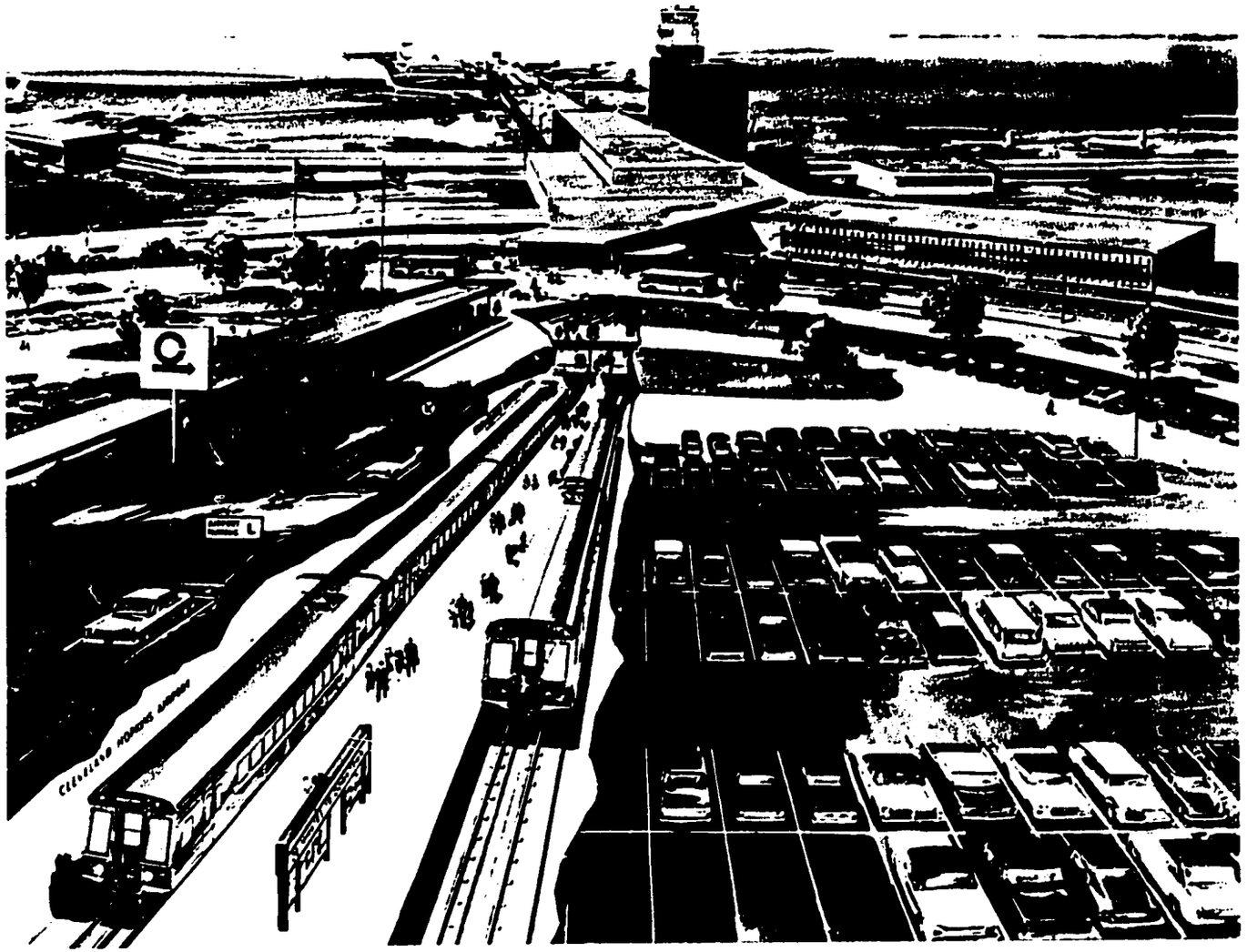
ILLUSTRATION VI



PRELIMINARY CONCEPT OF METROPOLITAN TRANSPORTATION CENTER

STATE OF NEW YORK — METROPOLITAN TRANSPORTATION AUTHORITY

ILLUSTRATION VII



A multimode terminal — United States Department of Transportation

TRANSPORTATION PROBLEMS—SUMMARY

As we move through the 20th century, we are discovering that our technology has advanced at a more rapid rate than our customs, attitudes, and traditions have changed. Our population has grown, the demand for transportation service has grown, yet we govern ourselves by many small uncoordinated governmental units, we approach our problems piecemeal, and in general we tend to function much as we did 50 to 75 years ago. The result is that the transportation systems of our large urban centers are breaking down.

In this first section,we have taken a look at what the problem is, why it has developed, and why it presently is not being solved. In order for us to begin to make improvements, leading to possible solutions, we must first recognize the problems and admit that changes must be made. Once we bring ourselves to admit our needs we can begin to correct the problem.

In the next section,we will take a look at transportation as it presently exists and see how the existing conditions and lack of financial resources present us with an inefficient transportation system.

TODAY'S TRANSPORTATION AND ITS SOCIOLOGICAL PROBLEMS

CORE THOUGHT

The vitality of the Nation - its productivity, progress, and protection - rests in large measure upon its transportation system. If that system falters the Nation suffers.

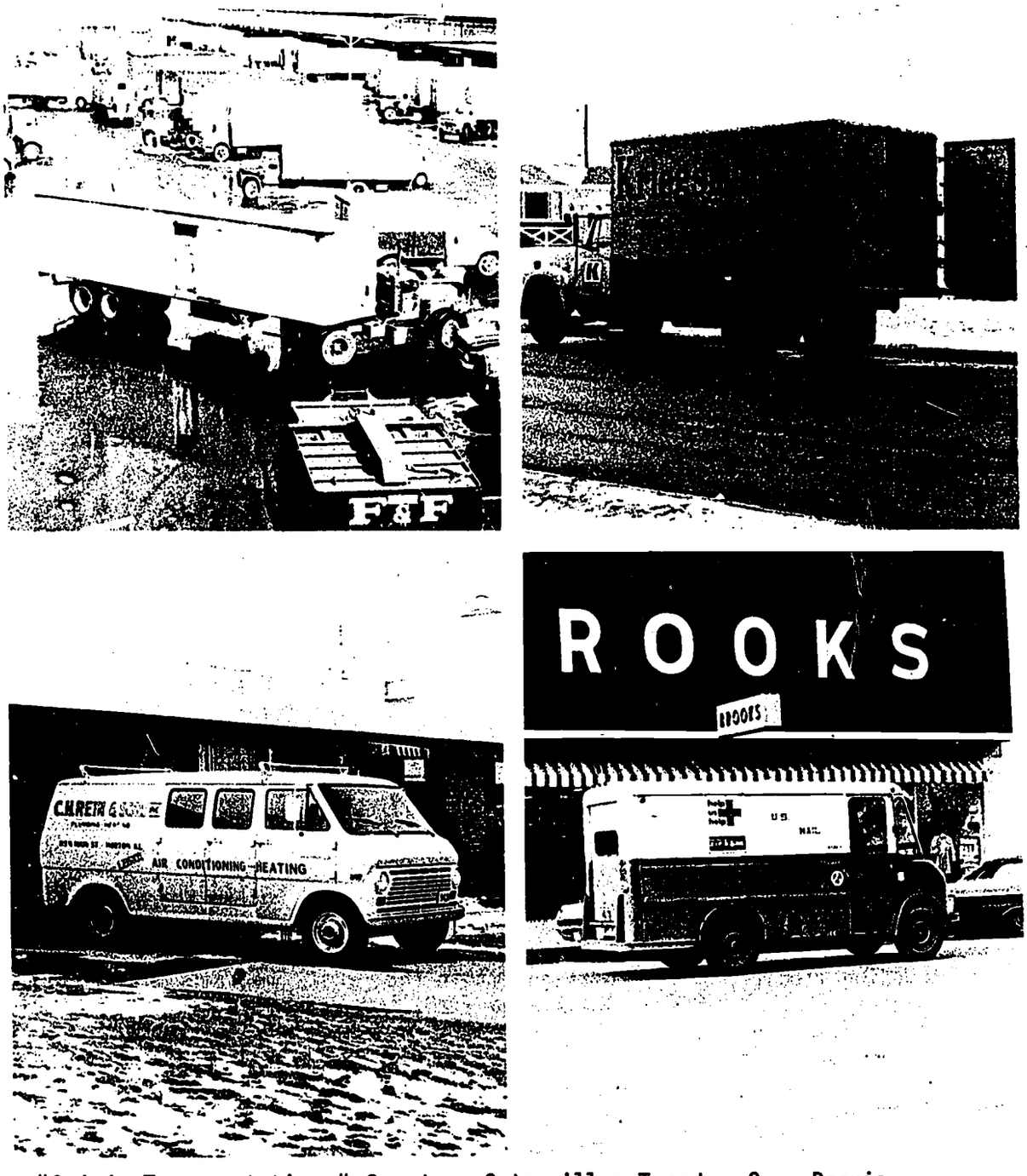
* * *

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT PART DOES THE TRUCKING INDUSTRY PLAY IN THE NATION'S TRANSPORTATION SYSTEM?		
. Trucks move America. - Of the 100,000,000 motor vehicles in the United States, 16,700,000 are trucks.	. How dependent is your community upon trucks for the vital necessities of life? - How many trucks a day deliver goods to your school? - How often do trucks deliver to the stores where you trade? What are the different kinds of deliveries made to these stores? How many trucks deliver at these stores each day? - How many kinds of deliveries do you receive at your home by truck?	. See illustration VIII. . Ask your school's head custodian and cafeteria manager how many trucks deliver at your school each day. . Store managers or owners . Common carriers deliver to retail stores more than to grocery stores, while contract or private carriers will generally deliver to the grocery stores. . The largest share of goods shipped by common carrier moves from one manufacturer to another or to a wholesaler rather than to the consumer.
- Trucks move 388,500,000,000 ton-miles of freight every year. (A ton-mile	. Ask a representative from a local trucking company to speak to the class on how his business affects the local community and	. Select a representative from a fairly major trucking company, not a small concern.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
is 1 ton moved 1 mile.) - 25,000 cities and towns in the United States are <u>wholly</u> dependent upon truck transportation as a means of supply. - All communities receive most of their goods by truck. Trucks haul practically everything we consume at least part of the way.	how the entire industry affects our Nation.	. *Trucking and Transportation,* Free Teaching Aids, Educational Services, American Trucking Associations, Inc. 1616 P Street, N.W., Washington, D.C. 20036 (Secure catalog of teaching materials from which the teacher may order classroom quantities.) Also, from the same source, secure *American Trucking Trends* for the current year. . Current report: Motor Transport Economics #20, *Transportation and Trucking in 1980,* American Trucking Associations, Inc.
. There is increasing competition in the trucking industry.	. Ask a representative of a local trucking company to speak on the kinds of competition in the trucking industry and its results. . What kinds of competition in the trucking industry exist in your neighborhood? - Are there several small hauling agencies? - Are there several long distance haulers? - Do haulers compete for the same business?	. *The Interstate Commerce Act,* United States Government Printing Office, Washington, D.C. 20402, 1968 . The Interstate Commerce Act is intended to restrict entry of new motor common carriers into interstate-for-hire trucking. See page 1 of the act. . *1970 Motor Truck Facts,* Automobile Manufacturers Association, 366 Madison Avenue, New York, New York 10017

ILLUSTRATION VIII

Trucks serve many transportation needs



"Crisis-Transportation," Courtesy Caterpillar Tractor Co., Peoria, Illinois 61602

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		. *Trucks in Urban America, Trucks in Rural America,* and *The Problem Solvers,* (pamphlets), Public Relations Department, American Trucking Associations, Inc. . Office of Public Affairs, New York State Department of Transportation, State Campus, Albany, N.Y. 12226. Ask for a copy of New York State trucking regulations.
DO INCREASED COMPETITION AND OUTDATED REGULATIONS CAUSE CONSUMERS TO PAY MORE AND RECEIVE LESS ADEQUATE SERVICE THAN THEY ARE ENTITLED TO? . One problem facing the trucking industry is that revenues do not rise as fast as costs, thus putting a squeeze on the profitability and service of the industry. . Defenders of the trucking industry maintain that while there may be inefficient operators, in general the charge of inefficiency adding to consumers' costs is not true. These defenders state that	. How many trucking companies operate in your area? - How many are long distance truckers hauling goods 500 miles and over - interstate and intrastate haulers? - How many are local hauling companies working within the local area - 25 mile radius? - How many are short haul companies - over 25 miles but less than 300 miles?	. Ask the local Chamber of Commerce, local truckers' association, or a local trucker for information. . If there is a truckers' association, an official can tell you how many companies are long, intermediate, short, or local hauling companies. . The Yellow Pages may describe the kinds of hauling many of the companies in your area perform.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
the trucking industry, while it has its problems, is generally providing good service at a competitive cost.	- How many are intermediate haul companies - over 300 miles, but less than 500 miles?	
- Many argue that the present regulatory system of the industry prevents efficient operation of individual companies.	. What solutions to the problems of the trucking industry are suggested by the students? - How could greater efficiency and better profits for the trucking industry be achieved in cities like New York? - How do students think that trucking services could be improved locally? . How can the consumer effectively express his dissatisfaction with the present system?	. In a city such as New York, up to 400 general commodity interstate motor carriers maintain terminals and/or terminal services in the area in order to handle freight in small shipments. Many of these terminals are operated far below capacity and many others lack modern handling systems. This reduces service to the consumer, yet raises the costs.
- The ICC has not modernized its regulations.	. What are the regulations of the ICC? Have they failed to keep pace with changing conditions?	. *The Interstate Commerce Act*, United States Government Printing Office . *Regulation or Deregulation in Public Transportation*, publication of Regular Common Carrier Conference, also current report: Motor Transport Economics #21, *Mergers in the Trucking Industry*, American Trucking Association, Inc.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- While in theory the Piggyback system should be an improved way of moving freight, in practice, because of union regulations and time consumed in loading, unloading, and shipping by train, some of the advantages are lost.	. Trucking companies must pay into the Teamsters' Union Retirement Fund when using Piggyback services. Should this be the case? What justification might the Teamsters' Union have for requiring such payment?	. *National Transportation Policy: Preliminary Draft of a Report Prepared for the Committee on Interstate and Foreign Commerce,* United States Senate, by the Special Study Group on Transportation Policies in the United States, United States Government Printing Office, Washington, D.C. 20402, January 3, 1961, p. 547: "The regulatory system is entangled in a archaic web of operating authorities so complex that their cost to the efficient and economic transport needs of the nation... is incalculable."
IS THERE A NEED FOR INTEGRATION OF THE TRUCKING INDUSTRY WITH OTHER FORMS OF TRANSPORTATION?		
. Transportation integration means combining the resources of the different transportation systems to obtain maximum efficiency in the movement of goods and passengers.	. What integrated methods do local hauling companies use to obtain greater efficiency?	. A representative of a local trucking company can illustrate how his company uses other modes of transportation to achieve greater efficiency. . See illustration VII.
. Transportation integration can be achieved by different methods: - The Piggyback system of shipping long distance is an example of integrating truck transportation with rail or ship transportation.	. Where does the term "Piggyback" come from? - Have one student climb on the back of another student and have the second student walk around the classroom. What is this activity called? What service is the second student performing for the first student?	. Piggyback is the placing of loaded truck trailers on railroad flat cars or ships to be hauled to another central location. This system permits greater quantities of goods to be moved at lower costs with fewer laborers involved.

ILLUSTRATION IX

Modern railroad freight handling

Courtesy of the Association of American Railroads, Public Relations Department, American Railroads Building, Washington, D.C. 20036

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	Truckers claim that because of switching tie-ups, etc., the apparent advantages of Piggybacking are lost, and that this mode of transportation does not provide the superior service one might expect. What is the experience of local manufacturing firms regarding this problem?	. *This is Piggyback, Railroads Unlimited!*, Association of American Railroads, American Railroad Building, Washington, D.C. 20036
- Containerization could solve a costly problem in handling small parcels. . Containerization also tends to limit theft since many small objects may be securely locked in one large container.	. Give a student a dozen empty shoe boxes and ask him to carry them around the room. Does he have trouble? Why? Now place the dozen boxes in one large box. Ask the student to carry the one large box around the room. Does the student have the same trouble as before? Why not? What is different with the second arrangement?	. Containerization is the placing of many small parcels into one large container for more efficient handling of items going to one place. (Containers may be shipped by air, rail, water, or truck.) . See illustration IX. . *Containers: Land, Sea and Air*, Public Relations Department, American Trucking Associations, Inc.
. A truck line can haul some commodities faster than rail and cheaper than air, or to put it negatively, a truck line is slower than air and more expensive than rail. Trucking generally is the most efficient form in that it saves the shipper money when compared with air freight and it saves the shipper time when compared with rail.	. Do local manufacturing companies use rail, air, water, or truck transportation? Ask a representative from a local manufacturing company what different modes of shipment his company uses. Why does his company use the modes it does?	. Rail travel from one point to another, over a long distance, is sometimes preferable because of the exclusive rights-of-way railroads have. They are less likely to be affected by traffic condition changes. However, if railroad terminal facilities are not readily available, or service is poor, the advantages of rail transportation are oftentimes lost.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Because of rising wage scales, transportation and handling costs have played a major role in increasing consumer costs. Greater integration of air, rail, and truck transportation, using more modern technological methods, could bring savings to consumers.	. Have pupils select local industries as problems for study. What modes of transportation are presently used to bring commodities to the plant? What modes are used to transport the finished product? Are integrated modes used? Would integrated modes seem to offer better results?	. Air travel is faster since greater average speed can usually be obtained than by truck. Air shipment is more expensive but with perishable goods, speed is necessary if the item is to be saved from loss.
	. What methods do truckers who are most efficient in the moving business use that others do not?	. Ask a local mover to comment on this question.
- Trucks can sometimes be more efficient as feeders to trunk lines and carriers from trunk lines than attempting long distance hauling. Using the best of the Piggyback system and the trucks as feeders might make both systems more efficient.	. Ask a long distance hauler if he agrees with this statement or not. Why does he or why does he not?	. A trunk line is a system handling long-distance through traffic; a main supply channel.
WHO SHOULD PAY FOR THE NECESSARY NEW AND IMPROVED ROADS IF TRUCKS ARE TO CARRY A MAJORITY OF THE NATION'S FREIGHT?		
. The trucking industry claims that they pay more than their fair share of the cost of highways through road use tax. They pay in excess of $5 billion in	. How do the motorists feel about the amount of road tax that truckers pay? How do motorists feel about trucks on the highway? If truckers paid higher road taxes, who would ultimately pay the additional cost?	. Contact your local American Automobile Association and find out what position the association and its members take.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
highway taxes each year. This type of cost to the carrier tends to be passed on to the user of the service, and, ultimately to the consumer.	. Ask a local trucking representative how much money his company pays in highway taxes each year. Does he think it is too much? Why? Do you think that what he pays is too much or too little compared to the number of miles his trucks travel and the service he performs? Could this service be better performed in other ways? How?	. Have the students ask the members of their families and their friends for their views.
	. The question of whether trucking agencies pay too much or too little for the use of roads may be the subject of a panel discussion if you can arrange for a representative of a trucking company to debate with students.	. Current Report: Motor Transport Economics #5, *Highways ... The Years Beyond 1972;* #13, *Highway Financing;* #24, *The Road to Highway Safety,* American Trucking Associations, Inc.
	. Ask a representative of the airlines or railroads whether he thinks trucking companies pay their fair share of road costs through their road use tax.	
	. Does your area have an interstate highway? What aid does the trucking industry derive from the interstate highway system?	. Contact the New York State Department of Transportation and the American Trucking Associations, Inc., for information.
	. Does your area have a law prohibiting trucks from being in the central business district during certain hours of the day? Do you have roads in your area closed to trucks? Should trucks be excluded in such a fashion?	. Contact a representative of local government to discover why the law to prohibit trucks in the central business district was passed.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	Should some roads or highway lanes be opened only for trucks? What inconveniences or benefits would result?	. *1970 Conference on Mass Transportation,* Vol. 4 of Mass Transportation Series, United Transportation Union, 15401 Detroit Avenue, Lakewood, Ohio 44107
. Some people claim that the public subsidizes the trucking industry through highway construction. They claim that the trucking industry does not pay for highways in fair proportion to its use. It is felt that heavy trucks cause excessive wear on highways and thus create more expense for the taxpayer.	. Ask a representative of the railroads or the American Automobile Association to comment on this argument. Ask a representative of the trucking industry what he thinks. Make sure that both sides of the argument are presented on this debatable issue. . Ask a representative of the New York State Department of Transportation if heavy trucks really do cause greater highway wear and, if so, what the State is doing to prevent this wear.	. Contact the Penn Central Railroad, the Delaware and Hudson Railroad, or any line serving your general area. . Contact the American Automobile Association branch serving your area.
HOW DOES TRUCKING FIT INTO THE PICTURE OF EFFICIENT, INTEGRATED TRANSPORTATION?		
. Multimodal, integrated transportation creates greater efficiency. Trucking is a vital part of the picture. - Depending on your location, the kind of integrated transportation, if any, will vary. Large metropolitan areas can make use of more extensive	. What efficient multimodal forms of transportation exist in your area? - Do you have ports into which barges or ships enter and from which freight is transferred to trucks for distribution?	. *1970 Conference on Mass Transportation,* United Transportation Union, part 10, p. 221

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
integration than smaller areas. In the rural area there may be no possibility for effective integrated transportation to take place. - ICC and State transportation regulation will have to be changed to permit full integration. - Governmental, industrial, and union rules and attitudes must change to allow multimodal, integrated transportation to become a successful reality.	- Do you have an airport into which freight moves for truck delivery? - Is there a railroad freight yard where goods are transferred to trucks? What advantage is furnished by multimodal transportation facilities in your area?	
. It is not uncommon for motor carriers to expend 96 percent of all revenue in expenses of operation. Some carriers will operate in the 70 percent range, but others may operate in the 100 percent range. The latter will eventually be forced out of business.	. Ask a representative of a local trucking company how much of his company's revenue is spent on expenses of operation.	. Ferris, Martin T., and McElhiney, Paul, *Modern Transportation: Selected Readings*, Boston, Houghton Mifflin Co., 1967, p. 59
. Trucks carry only freight; passengers are carried by other operations. However, railroads, airlines, steamships, and buslines carry both passengers and freight.	. Make a bulletin board showing the valuable role that trucks play in America. Show how the role of trucks compares with other forms of transportation in serving our society.	

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Some experts see the trucking industry sifting down by 1985 to 50, perhaps 100, big, long-haul carriers with the rest being essentially feeder operations.	. What problems might be created by extensive mergers? How might such mergers affect the consumer?	. Contact the Anti-trust Bureau of the New York State Department of Law to find out what their position is on such mergers.
	. Could greater efficiency be achieved through merger of some of the 15,000 trucking companies? Would greater cooperation with rail, air, and water transportation agencies improve the service which trucking provides?	. This question could be asked of local trucking companies. Find out what the position of the American Trucking Associations, Inc., is on such mergers.
. The trucking industry has a responsibility to society. Among the existing problems are these: - Trucks clutter up the roads, increasing our air pollution and noise pollution. Although, according to NYSDOT most trucks burn diesel fuel, which produces an emission which has more visibility and odor than combustion products from gasoline engines, the emissions from gasoline engines are more toxic.	Ask local trucking companies what efforts are being made to cut down on air and noise pollution. Write to the New York State Department of Transportation to find out how successful the tests on air and noise pollution devices have been.	. In August 1971, the New York State Department of Transportation installed air and noise pollution testing devices on 10 Niagara Frontier Transit System buses. Each testing device costs about $2,000. This test is being conducted over a 24-month period of time.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Shipping costs are high.	. Find out what the cost would be to ship 40 pounds 600 miles from your area, using different modes of shipping. Compare these different costs and try to determine which mode gives the best service at the lowest cost.	. Contact a local motor freight terminal, the Post Office, United Parcel, the Railway Express, a local air freight company, and a bus company such as Greyhound or Trailways.
- Trucks are not always the fastest means to ship items. - Trucks tend to cause greater wear of the highways.		. Air transport is faster for long distances. In certain cases, rail may be faster than trucks, but as a rule trucks provide a more convenient service.
	. Ask a representative of a trucking firm what problems, if any, would be caused by being allowed to travel only at night and only over certain routes.	. Trucks traveling only at night and only on certain routes might work if careful planning and scheduling occurred first. This would probably require careful cooperation between the trucking industry, governmental agencies, the Teamsters' Union, and shippers.
	. Have any special regulations been instituted in your area governing motor trucks? What are the regulations?	
	. Have the class consider the following suggestions that have been advanced to improve the trucking industry. How valid do the pupils feel these suggestions to be? - Trucks might be allowed to travel only at night and only on certain routes. - Noise and air pollution might be better regulated.	. Contact the Environmental Protection Agency, 1120 20th Street, N.W., Washington, D.C. 20480, and ask what areas have instituted special antipollution programs for motor vehicles.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	- Greater efficiency might be instituted to improve overall shipping by working toward an integrated system.	. New York State Department of Environmental Conservation, Wolf Road, Albany, New York 12205
	- Trucks could be required to pay a greater proportion of road costs based on ton-miles traveled.	. Ruppenthal, Karl M. and McKinnell, Henry A., Jr., *Transportation Today and Tomorrow*, Graduate School of Business, Stanford University, Stanford, 1966, ch. VII
		. Current Report: Transportation Trends, Marketing At a Crossroads #25, *The Challenge to Transportation*, American Trucking Associations, Inc.

* * *

WHAT HAS HAPPENED TO THE NATION'S RAILROAD SYSTEM?

The following references will provide a good background for the study of the railroad unit:

"Movin' On", From the Beginning of Railroading, United Transportation Union

Farris, Martin T. and McElhiney, Paul T., *Modern Transportation:* Selected Readings, Houghton, Mifflin Company, Boston, 1967, Part IA

Railway Age, Simmons-Boardman Publishing Corp., 30 Church Street, New York, New York 10007

Modern Railroads, Cahners Publishing Co., 5 South Wabash Avenue, Chicago, Illinois 60603

Trains, Kalmbach Publishing Company, 1027 North Seventh Street, Milwaukee, Wisconsin 53233

Association of American Railroads, American Railroad Building, Washington, D.C. 20036. Request: *Railroads of America, Railroad Review and Outlook, Yearbook of Railroad Facts*, and *Railroad Quiz*

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Railroads built America and may continue to be one of the most efficient forms of transportation.	. Obtain a map of the Nation's railroads.	. Association of American Railroads
	. What role did railroads play in building your section of the country? What is the local history of railroading?	. Your local historical society can provide much of your area's railroad history.
. Railroads have a unique capacity to move bulk commodities and large numbers of people at fairly high speeds.	. Ask the shipping or traffic manager of a local industry what methods he uses to ship out manufactured goods. Ask him what problems he has. How is the railroad service which he receives? Would he use more rail transportation if he could get better service?	. Contact local industries for this information. . Contact local railroad officials (operating and sales) to determine available service and problems.
. Railroad profitability has declined for various reasons: - development of competing forms of transportation (highway, air, etc.) - lack of efficient, modern business practices.		. See illustration X. . Net profit of railroads in 1970 was $126.8 million, down from $505.4 million in 1969. (Source: U.S. News and World Report, May 31, 1971, p. 11) . Many of the railroads have tried to function in the 20th century much as they did in the 19th.

ILLUSTRATION X

Scope of the U.S. railroad industry—

Railroads: 69 major lines - each with more than 1 million dollars a year in revenues.

Workers: 570.000. excluding Alaska and Hawaii.

Payrolls: 5.6 billion dollars in 1970.

Freight traffic: 41 per cent of goods hauled between cities. including two thirds or more of coal, household appliances. new autos. lumber, chemicals. iron and steel shipped in U. S.

Total revenue: 12 billion dollars in '70, a record high.

Profits: About 127 million dollars last year, though many roads actually lost money. More than 420 millions in dividends was paid out to stockholders, who numbered 385,000 at latest count.

Taxes: About 1.1 billions a year paid to federal, State and local governments.

Assets: 33 billion dollars in real estate, equipment, other property.

Capital investment: Nearly 1.4 billion a year for new cars, other equipment and facilities.

Other spending: 2.6 billions a year for fuel, materials and supplies.

Source: Interstate Commerce Commission, Association of American Railroads

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Archaic and inhibiting labor practices continue. - Labor unions have attempted to protect the jobs of their members despite declining revenues.	. Investigate the cost of the settlement of the 1971 railroad strike. What was the August 2, 1971, settlement and what did it consist of?	. Contact the United Transportation Union for a copy of the settlement contract or read newspaper articles of August 3, 1971. . *New Drive to Cut Railroad 'Featherbedding'*, U.S. News and World Report, July 19, 1971, p. 49
- Full crew laws, and similar practices have kept labor costs extremely high.		
- Diversification of investments may detract from the purpose of the corporation.	. Why have railroads such as the Penn Central spent their money on real estate and other investments instead of reinvesting in the parent railroad system? What has been the effect?	. *Pennsy will sell 23 Valuable Sites in Mid-Manhattan*, New York Times, June 3, 1971
- Railroads have failed to modernize their equipment.	. Ask a representative of the nearest railroad what that line is doing to modernize its equipment.	. Contact the Association of American Railroads. . *Fight to Save the Railroads*, U.S. News and World Report, May 31, 1970, p. 10
	. Contact the Metropolitan Transportation Authority to find out what is being done to improve service on the Long Island Railroad and the New Haven Division of the Penn Central Transportation Co.	. Metropolitan Transportation Authority, 1700 Broadway, New York, New York 10019
	. Using the *Year Book of Railroad Facts*, make a chart of what has happened to railroad revenue and passenger traffic in the last 10 years. (A line	. *Year Book of Railroad Facts*, Association of American Railroads, American Railroads Building, Washington, D.C. 20036

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	chart will probably best illustrate what has happened.)	
WHY HAVE SOME RAILROAD LINES CONTINUED TO BE SUCCESSFUL, WHEN OTHERS HAVE HAD DIFFICULTY?		
. Some rail lines have concentrated on freight, which is by far the largest part of the rail business and is generally more profitable than passenger service. Five major U.S. railroads are now bankrupt, most notably the Penn Central.	. Did you ever have rail passenger service in your community? Why did it stop? Have you now lost your total railroad service? Why? What did the railroad claim was the reason when they asked the Public Service Commission for permission to cease service?	. Contact your local government officials or the Office of Transportation Regulatory Affairs, New York State Department of Transportation, Albany, N.Y.
	. What is the financial condition of the railroad in your area, if one still exists?	. Passenger revenue has steadily declined in the last 30 years.
. Some American railroad executives say that they could operate the railroads at a profit and provide good service if intercity passenger train travel were limited to 250 miles, if antiquated labor laws were ended, and if Government regulations were curbed.	. Select interested students and set up a debate on the topic: "Railroad passenger service is dead." Divide the students into two groups, one side concurring with the premise that the future of railroads lies only in freight traffic, and the other side dissenting, arguing that passenger service can be revived. Have each side research their position and attempt to prove their point. Have this debate presented for the class, an assembly, or some businessmen's group.	. Association of American Railroads . The magazines listed as general source material . Readers Guide to Periodical Literature . America's Sound Transportation Review Organization, American Railroad Building, Washington, D.C.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Over-regulation and excessive taxation by politically motivated interests have contributed to the problems of the railroads in some sections of the country.	. Ask your local government officials why they sometimes tax railroad property more heavily than other property? Is this fair? What have the results been?	. Check with your local tax assessor and other local government officers.
. The railroad industry is demanding relief from Federal controls. The industry claims that prescribed charges for carrying freight at rates that sometimes do not cover costs, inability to end unprofitable service, etc. are major causes of difficulties of rail lines.	. Obtain testimony from hearings on rates and service.	. Office of Transportation Regulatory Affairs, New York State Department of Transportation, Albany . Interstate Commerce Commission . *Railway Age,* November 29, 1971. This issue discusses various proposals for Federal legislation to reform regulation of the railroad industry. . *Countdown for America's Railroads,* ASTRO (America's Sound Transportation Review Organization)
. Some people think that if the development of efficient transportation companies, moving goods by road, rail, air, and water, were encouraged, instead of being effectively blocked by outdated laws and overly restricted interpretations, some of the railroad lines would have a better chance to survive.	. Check with the Office of Transportation Regulatory Affairs, New York State Department of Transportation, and the Interstate Commerce Commission to determine what changes in the laws would be necessary to form such all-inclusive transportation companies.	. Office of Transportation Regulatory Affairs, New York State Department of Transportation, Albany . Interstate Commerce Commission, Washington, D.C. 20000

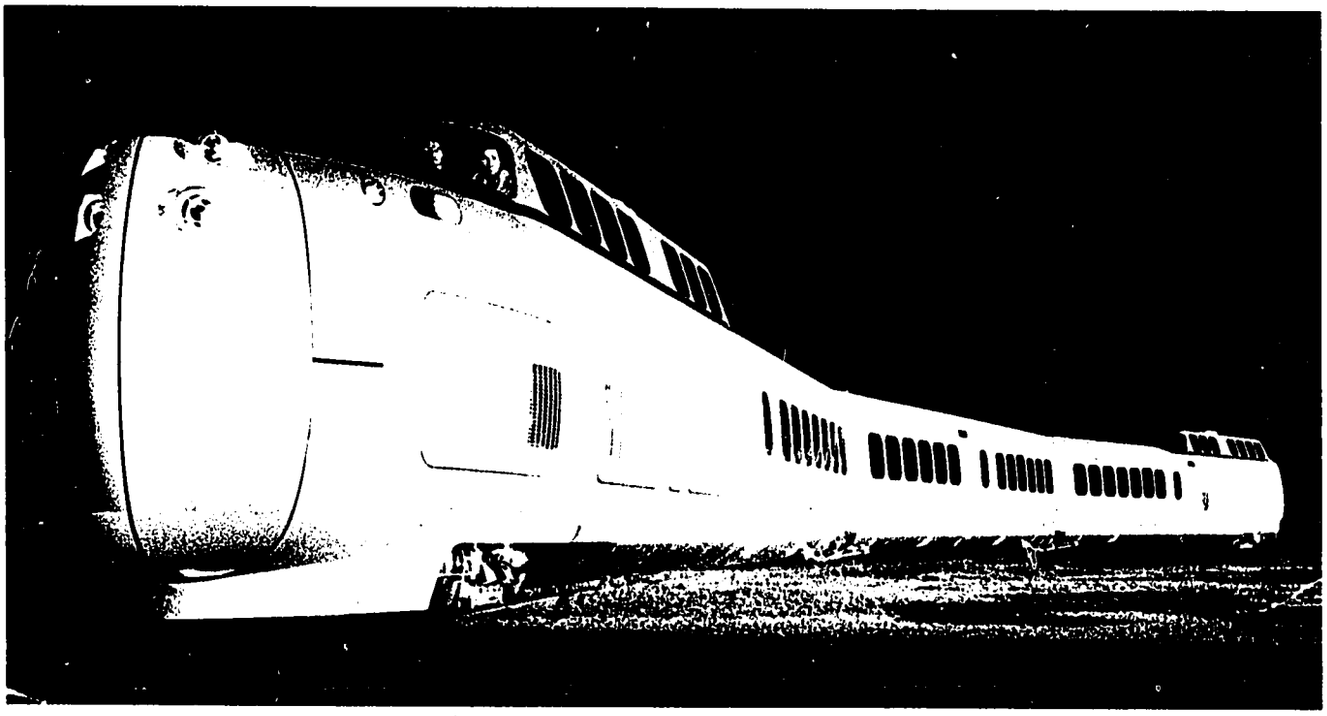
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. There is an unequal application of Government regulations between modes. For example, freight rate controls are not applied when agricultural commodities move by truck or when bulk commodities move by barge, yet are fully applied when the same goods move by railroad.		
. The railroads claim that in all other modes of transportation some of the rights-of-way are Government provided or financed and not taxed. The railroads must, however, pay the cost of the roadbeds and rights-of-way and then also pay property taxes.	. The Penn Central and other railroads are getting tax relief. What has your local area done to aid the railroads? How much tax is lost by your community if tax relief is given?	. Contact your local government officials to find out what the taxes are for the railroad, if there is one in your community. . New York State Real Property Tax Relief Program for Railroads, administered by the New York State Department of Transportation . *The American Railroad Industry, A Prospectus*, America's Sound Transportation Review Organization
	. Truckers and bus operators claim they pay taxes for all services provided. Investigate this claim and try to determine the validity of both sides of the argument.	. Contact a major truck or bus company serving your area to obtain information in this investigation.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
CAN THE RAILROADS MAINTAIN THEIR PRESENT POSITION OR REGAIN THEIR FORMER ROLE?		
. Many believe that only some form of nationalization of the railroads can save the lines from bankruptcy. Others feel that removal of regulation might be the answer.	. Obtain information on the operation of the railroads in Canada where some of the lines are nationalized. Do the Canadian lines have problems similar to the problems faced by the lines in the U.S.?	. Canadian Transportation Commission, 274 Slater Street, Ottawa, Canada
. Amtrak, the National Railroad Passenger Corporation, was established in 1971 to insure continuance of modern, efficient, intercity railroad passenger service throughout the country. Responsibility for most such service was placed in the hands of this quasi-governmental corporation which is supported in significant measure with public funds.	. Study the aims and goals of the National Railroad Passenger Corporation. Why was this approach used instead of outright nationalization?	. *Coming: A New Era for Train Buffs*, U.S. News and World Report, May 3, 1971, p. 29 . Obtain a copy of Public Law 91-518, the Rail Passenger Service Act of 1970, October 30, 1970
. Amtrak is not a nationalization of the railroads, but a unique attempt to coordinate nationwide intercity rail passenger service while relieving individual railroads of the financial burden. Those railroads which elected to join Amtrak have had to pay to be relieved of their passenger service		. *Modern Railroads.* The December 1971 issue is devoted to a special report on Amtrak.

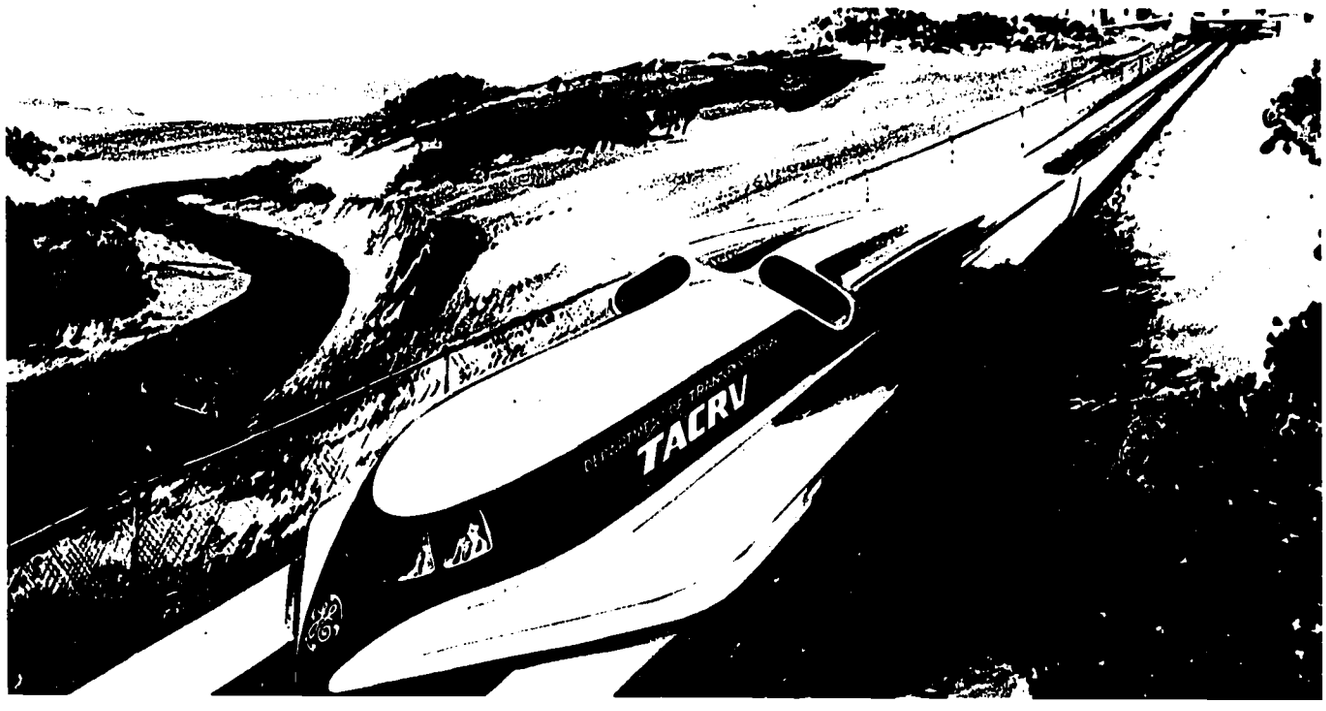
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
obligations. Trains are still operated by the railroads under contract to Amtrak.		
. Amtrak operates short-haul "corridor" routes as well as long-haul service.	. Obtain a copy of complete Amtrak timetables for your area. Has there been an improvement in the rail service since Amtrak took over? Has there been an increase in the number of passengers riding the trains since Amtrak took over?	. Contact the station manager at the nearest passenger station of Amtrak.
. Some people argue that railroad passenger service does not stand a chance to survive even with much help from the Government, such as Amtrak.	. Do the students believe that there is a future for railroad passenger trains? Do they feel that railroad passenger service in the latter half of the 20th century is necessary and important? . Consider intercity vs. commuter service. Is there need for both these services?	. *How to Run a Railroad: Amtrak Learns the Hard Way*, U.S. News and World Report, August 30, 1971, p. 42 . *Future of Passenger Trains*, U.S. News and World Report, January 3, 1972, p. 44
. It is hoped that new concepts and ideas of railroad modernization will provide renewed life to the industry.	. What is the railroad serving your area doing to modernize? Is it doing anything? If it is doing nothing, why is this the case?	. Contact a representative of the railroad serving your area.
- The Federal Railroad Administration, through the Office of High Speed Ground Transportation, is testing and implementing new concepts of rail travel. Some of their work	. Make a bulletin board of pictures and drawings of proposed designs for new railroad equipment. Illustrate what railroads hope to do to attract both passenger and freight business back to the railroads.	. Federal Railroad Administration, Office of Public Affairs, Department of Transportation, Washington, D.C. 20590 . *The Annual Report of the U.S. Department of Transportation*, Superintendent of Documents, U.S.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
is with: . welded rails for high speed equipment (already in use) . turbo-trains . the metroliner . duo-track systems . rubber-tired trains . high-speed tracked air cushion vehicles (TACV) . magnetic trains . pneumatic trains		Government Printing Office, Washington, D.C. 20402 . Hellman, Harold, *Transportation in the World of the Future* . See illustration XI.
- Through various research projects, new propulsion methods are being studied and developed such as: . jet power . gas turbine engines . vacuum tube systems . linear induction motors	. Contact the Federal Railroad Administration and find out what research is being done on new sources of propulsion.	
. The Japanese have been successful with super-express trains traveling more than 100 miles an hour. One must remember that the level of car ownership in Japan is much lower than in the U.S. so that the demand for such train service may be much greater than in our country.	. Contact the Office of High Speed Ground Transportation to find out what the U.S. is doing in the area of high speed trains.	. Office of High Speed Ground Transportation, Federal Railroad Administration, United States Department of Transportation, Washington, D.C. 20590

ILLUSTRATION XI



American turbine-powered express



Jet A.C.V. train

Photographs courtesy of United States Department of Transportation

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Each new concept in rail transportation must be studied for its effect upon the environment.	. What kind of studies are conducted? What information is being sought in the studies? What effects do pupils foresee as the result of these studies?	. Office of Assistant Secretary of Environment and Urban Systems, United States Department of Transportation . Environmental Protection Agency, 1129 20th Street, N.W., Washington, D.C. 20460
WHAT IS THE ROLE OF NEW YORK STATE IN RAILROAD TRANSPORTATION?		
. New York State has been in the forefront in the attempt to provide better railroad traveler service.	. Does New York State have a responsibility to the residents to get involved in the railroad business? Specifically should it spend public money to provide: - commuter service? - long-haul or intercity passenger service? - better freight service?	
	. Contact your State Representative to find out why the State entered the mass transit field.	. *A Program for Action*, Metropolitan Transportation Authority, 1700 Broadway, New York, N.Y.
- The Metropolitan Transportation Authority has a wide range of responsibility for providing rail passenger service (commuter and rapid transit) in the New York City metropolitan area.		. *Where Do We Go From Here?* 27 minute color film, Metropolitan Transportation Authority . Request: *The Annual Report* and other informational material from the Metropolitan Transportation Authority.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. In 1966, the Metropolitan Commuter Transit Authority, predecessor to the M-T-A, purchased the Long Island Railroad for $65 million for the State of New York. The Long Island Railroad continues to function as an operating corporation under M-T-A jurisdiction while the Authority has assumed responsibility for the capital improvement program which has already resulted in improved service.	. How does New York State's program, through M-T-A, compare to those in other states, for example New Jersey through its Department of Transportation, or Massachusetts through its Massachusetts Bay Transportation Authority?	. New Jersey Department of Transportation, Trenton, N.J. 08608
	. If your school is located on Long Island or in Westchester County, ask students to conduct a community poll regarding the M-T-A claims of improved service. Has service improved? Is more modern equipment in use? What steps, if any, should be taken to effect further improvement? [It might also be interesting to poll residents as to whether they supported the 1971 proposed transportation bond issue, which failed to pass.]	. Massachusetts Bay Transportation Authority, Boston, Mass. 02109
		. Trains, January 1971, and February 1971, had a two part article on the Long Island Railroad.
		. Trains, April 1971, had an article on the Erie Lackawanna passenger service which discussed some of the activities of the New Jersey Department of Transportation.
. On January 1, 1971, M-T-A purchased the commuter assets, including the New Haven Division Main Line and some rolling stock of the former New Haven Railroad from the Penn Central for over $9 million. Penn Central operates commuter service on the lines under contract to the M-T-A and the State of Connecticut which concurrently leased the adjoining commuter facilities in Connecticut.		

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Negotiations were completed between the M-T-A and the Penn Central for the lease of commuter facilities on the Hudson and Harlem Divisions. Penn Central will operate this service under contract to the Authority.		
. Transportation authorities in other areas are also studying possible rail transit systems: - Niagara Frontier Transportation Authority - Rochester-Genesee Regional Transportation Authority	. Request: *Summary Report* of the N.F.T.A. . Request the latest information on the transit study from the R.G.R.T.A.	. Niagara Frontier Tranportation Authority, Buffalo, New York 14240 . Rochester-Genesee Regional Transportation Authority, Rochester, New York 14603
HOW DID NEW YORK STATE OBTAIN THE NECESSARY MONEY TO ASSIST RAILROAD COMMUTER SERVICE IN THE STATE?		
. In 1967, the voters of the State approved a $2.5 billion transportation bond issue.	. Much of the $2.5 billion bond issue was spent for highway and mass transit projects in and around the large urban centers. How much responsibility do the more rural areas of upstate New York have in helping finance the needed transportation of the urban areas? Have your students discuss this problem, since it goes directly to the root of the issue of using	. *People Have Been Asking*, New York State Department of Transportation . Ask your local State Representative to speak to the class about the bonding system of financing the needed improvements in New York State.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	statewide bond issues to finance transportation improvements.	. Chapter 717, New York State Laws of 1967
. In 1971, the voters of the State disapproved a $2.5 billion transportation bond issue.	. For what was the 1971 bond issue intended? What were reasons for its defeat? What are the implications of the defeat? What was the local attitude toward the 1971 Transportation Bond Issue?	. Newspaper articles before and after November 2, 1971, particularly the New York Times and the local newspapers
IS THERE A NEED FOR NEW THINKING CONCERNING THE FINANCING OF RAILROADS?		
. The likely alternative to improved rail transportation is more highways or major shifts in patterns of living, employment, shopping, travel, and industry.	. Is the spending of more money for improved rail transportation, in some form, the best and cheapest solution to moving the population and commodities of the United States? . Would people accept and use public buses, instead of automobiles, if rail service were not available? . Could industry survive in its present form without rail freight service?	. Today's railroad systems represent an investment value, after depreciation, of $27 billion. It would take over $80 billion to rebuild the same systems from scratch. . Railroads serve 45,000 U.S. communities, using over 212,000 miles of rights-of-way.
- Nationalization of the lines is considered the most expensive form of financial aid. Some experts estimate it would cost $60 billion just to transfer ownership of the railroads to the Government.		

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Some railroad experts have proposed that the present highway trust fund could be merged into a general surface transportation fund to which railroads would contribute and from which they could draw. Some propose that railroads which desire to improve their rights-of-way, over and above past levels, be allowed to draw up to $400 million annually from the fund.	. Contact representatives of the trucking industry, the bus companies, or other representatives of highway users and find out what they think of this proposal.	. Highway Users Federation for Safety and Mobility, 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036 . Association of American Railroads, Two Pennsylvania Plaza, New York, N.Y.
. Some observers believe the Federal Government should guarantee loans for those railroads seeking to improve their facilities.	. What do students think of a guaranteed loan system? What problems can the students foresee in such a system?	. Contact your State's congressional delegation. . Contact the Urban Mass Transportation Agency and ask what studies are being made of such a financing plan.
. Perhaps railroads should qualify for Federal assistance after natural disasters, just as states do.	. It is argued that railroads are privately owned and that Federal funds should not be used to help private enterprise. Is this argument valid? Why or why not? - What about aid to Lockheed? - What about aid to bankrupt railroads? Should such Federal aid be made available to help all railroads?	. Federal aid is available to states for road reconstruction after natural disasters if the state is declared a disaster area. Private enterprise may get some Government-backed loans, but this money must be paid back. . Association of American Railroads . United Transportation Union

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. In some cases, higher transportation rates or a revision of rates may be necessary to reflect true cost.	. Who should pay the cost of transportation, the user or everyone on an equal basis? What do the students think?	. Contact a taxpayers' organization to find out its position on such issues as transportation bond issues and use of taxpayers' money to help railroads.
WHAT TRANSPORTATION NEED IS MET BY BUS LINES?		
. Bus transportation does not need a high-density population to be profitable.	. Do you have an intra-regional bus system in your area? Is it a private company or a public transit authority? Why have many areas been forced to create public transportation authorities? Could another method of financing have been used instead of the establishment of authorities, and thus enabled the private companies to continue?	. Most mass transportation systems that are in existence or in the planning stage involve a rail system. Such systems require a large volume of potential passengers to meet minimum costs for system maintenance and operation. The use of motor buses does not require such a volume of passengers to meet minimum costs. . *Busway-Freeway Rapid Transit*, Automobile Manufacturers Association, Inc., 320 New Center Building, Detroit, Michigan 48202
. Buses are not limited to set rights-of-way, but may travel the entire network of roads. Intercity buses are required to travel over specific routes which they are licensed to use.	. What advantages can a dependable bus system offer to meet an area's transportation needs that other mass transportation systems cannot offer?	. The transit system which involves the least walking, waiting, and transferring from one vehicle to another will, in most cases, produce the fastest door-to-door trip, provided it also can make reasonably good speed while in motion.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The cost of highways is partially supported by car, bus, and truck fees and license charges.	. How do bus companies help pay for the cost of highway construction and highway maintenance?	. Contact a representative of the local bus company to find out what fees the company pays for highway usage.
. Due to relatively inexpensive operating costs, buses can serve smaller areas and act as feeder systems to major transportation systems. This service is, however, dependent upon the type of equipment used on the route and on at least a basic demand.	. Would a dependable bus system solve your local transportation needs? Ask a member of the public transportation committee of your local government to speak to your class about your local transportation requirements and possible ways of meeting the local needs.	. Transit demands in most urban corridors not now served by rail transit can be met for the present and foreseeable future within the range of capabilities exhibited by the motor bus. This is particularly important in the many cities and urban travel corridors which may never reach the passenger-volume level to require or support rail rapid transit. . *1970 Motor Truck Facts*, Automobile Manufacturers Association . *Bus Facts*, National Association of Motor Bus Owners, 1025 Connecticut Avenue, Washington, D.C. 20036
. An underlying concept of improved urban bus transportation is to expand the express (nonstop) bus trip. With most large cities developing freeway networks and with a number of experiments	. Contact the New York State Department of Transportation to find out what is being done in the development of greater bus usage and what new ideas are being considered for using buses in rapid transit.	. New York State Department of Transportation . A local transit authority might be able to give the same or similar information.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
underway to control peak-hour freeway traffic volume in order to keep the roadways freeflowing, these facilities afford rights-of-way potentially usable by buses for the express portion of transit trips. All bus stops would be on local streets or at downtown stations.	. Do you have a rapid transit system in your area which incorporates the use of buses? How is the system working? What are its strengths and its weaknesses? Is it privately or publicly owned?	. Local business organizations, commuter organizations, and the Chamber of Commerce . The company or an authority which operates the transit system
. Depending on the demand, bus systems of varying capacity can be used to provide the transportation needed.	. If the problem of transportation is insufficient demand, has a mini-bus system been investigated for your area?	. Contact your local officials who are responsible for public transportation in your area. . Contact the city of Rome, New York, and find out about their successful mini-bus system which has been in operation for several years.

SOON WE MAY BE ABLE TO DIAL A BUS RIDE ANYWHERE . . . .

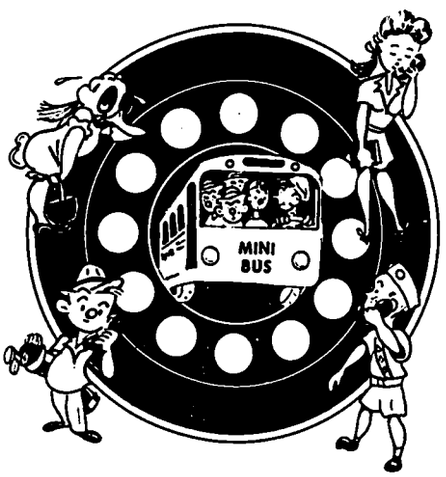


ILLUSTRATION XIa

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Metro-Mode is being developed by General Motors. It combines bus flexibility with rapid transit speed for short door-to-door trip time.	. Find out how successful the ideas of Dial-A-Ride have been in Peoria, Illinois, and Dial-A-Bus have been in Haddonfield, New Jersey, and Batavia, New York.	. General Motors Corporation, Public Relations Department, General Motors Building, 3044 West Grand Boulevard, Detroit, Michigan 48202
. Dial-A-Ride buses using the Dual Mode Vehicle System are being developed by Ford. This system is designed to provide a door-to-door collection system and then an automated entrance into large metropolitan centers.	. Are there other new concepts that are being proposed for bus usage?	. Transportation Research and Planning Office, Ford Motor Company, 23400 Michigan Avenue, Dearborn, Michigan 48124
. Cross-country travel by bus is inexpensive; many like to travel this way because they can see more of the country.	. Ask students how many have traveled a long distance by bus. Why did they choose the bus for transportation? What advantages or disadvantages do students recognize?	. *A Million Miles A Day*, Greyhound Corporation, 140 South Dearborn Street, Chicago, Illinois 60607
WHAT TRANSPORTATION NEEDS ARE MET BY SCHOOL BUSES?		
. School bus routes and busing to achieve school integration create tremendous bus demands.	. Does your school have a busing program for the purpose of improving the quality of education of all students? What is the added transportation cost to your school system?	. The transportation supervisor of your school system . The U.S. Supreme Court has ruled that students may be bused from one section of an urban area to another to obtain racial balance in the public schools.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The cost of school bus transportation is met by the school property tax and State aid for transportation.	. What percentage of students in your school ride the bus?	. Transportation supervisor . Forty-one percent of public school students are carried by school bus. . Statistics for New York State, school year 1968-69: - 2,164,569 pupils were transported at public expense for a total cost of $128,390,209. (Source: *1970 Motor Truck Facts*, Automobile Manufacturers Association)
. School systems have varying policies regarding transportation of pupils. New York State Education Law requires that high school students living more than 3 miles, but not more than 10 miles from the school building, be bused to school. Most school systems, however, have more liberal policies than required by law.	. Have the supervisor of transportation of your school district speak to the class on the transportation for your school - the cost, the problems, etc. . Have the students who ride the school bus prepare a list of what they think is good and not so good about busing in your school district. Ask them to suggest possible solutions to any problems. Use this material in a discussion with the district supervisor of transportation.	. Contact your school district supervisor of transportation.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT ARE THE ADVANTAGES OF RAIL RAPID TRANSIT?		
. Since rail rapid transit can move large numbers of people swiftly and economically, urban centers have tended to use this form of transportation wherever feasible. . Large capital expenditures, extensive construction activity, and lengthy periods are required, however, to build subways and elevated systems.	. From sources such as the library, older friends, and the Metropolitan Transportation Authority, discover the facts about the New York City subway system. Pictures and descriptive stories of the growth of the subway system may be arranged in a display. . Contrast the description which follows of a ride in a horse-drawn railway car with a ride in a modern subway. Has the situation changed much? "It is in vain ... to seek for relief in a city (horse-drawn) railway car. People are packed into them like sardines in a box with perspiration for oil. Passengers hang by the straps like smoked hams in a corner grocery ... pickpockets ply their vocation ... the foul, close, heated air is poisonous ... Both the cars and the omnibuses might be very comfortable if they were better managed." . The early fare, which was maintained for many years, was 5¢. What is it now? What is it likely to be? What changes have brought about the increase in fare?	. "The Subway Story," Metropolitan Transportation Authority . The first train of the New York City subway began operation on October 27, 1904. The train ran from Bleeker Street to 145th Street, making the run in 26 minutes. The first day, 350,000 passengers were carried and the headlines read: "Rush Hour Blockade Jams Subway." Even in those early days politics determined the route chosen. . The earliest New York City subway was a 9-foot tunnel, 312 feet long, from Warren Street to Broadway. It consisted of a tubular car, seating 22 passengers, which was literally blown back and forth pneumatically from one end of the route to the other.

ILLUSTRATION XII

Giant subway system serves millions

Courtesy Metropolitan Transportation Authority

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Subways have proved to be such effective ways of moving people that their growth has been phenomenal.	. Secure a copy of the present subway routes in New York City. How many subway routes are there? How many miles are covered?	. The American Transit Association figures one rail track can move 70,000 riders an hour; one exclusive bus lane can carry 40,000 persons an hour; only 4,500 motorists an hour can travel in one lane of an expressway, assuming an average of 1½ persons to an automobile.
. As cities spread into low-density suburbs and the use of automobiles increased, the steady growth of subway passenger traffic began to diminish.	. Why did the number of subway and surface car passengers in New York City peak at 2.5 billion riders a year in 1946-47 in spite of a continuing increase in the population of the city since that time? What factors might lead to a new peak?	. Subway construction is being considered in Buffalo, St. Louis, Dallas, Houston, and Detroit.
. With increasing problems of congestion and pollution, the interest in, and need for, urban rail mass transit facilities has increased.	. Ask pupils if they had their choice whether they would prefer the construction of urban rail transit or more automobile expressways and freeways. Why? What objections are being raised by urban dwellers to the construction of additional freeways through cities?	. New subways and urban rail lines are being built or definitely planned for construction in San Francisco, Washington, D.C., Atlanta, Baltimore, Los Angeles, Miami, Minneapolis-St. Paul, Pittsburg, and Seattle.
	. Experts estimate that between 20 and 36 U.S. cities could support rail transit. What New York State cities now without rail transit might be included in this number?	. Extensions of existing lines are being built or planned in New York City, Chicago, Boston, Cleveland, and Philadelphia.
. Almost everyone in a city with rail mass transit uses the subway occasionally and many rely on this mode exclusively.	. In a city of about 8 million population such as New York, as many as 8,872,244 people used the subway on a single day. If students are familiar with New York City, ask them to describe the methods of transportation they would use to get around the city. How many normally use the subways? use buses? use taxis? walk?	. *Untangling Big-City Traffic: The Big Push for Mass Transit,* U.S. News and World Report, May 25, 1970 . *Metropolitan Transportation - a program for action,* Metropolitan Commuter Transportation Authority

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCES
WHY, AFTER YEARS OF SUCCESS, IS AIR TRANSPORTATION HAVING PROBLEMS?		
. Uncontrolled growth of competition, with too little planning, has resulted in the creation of too many competing airlines.	. Is your area serviced by an airline? Is the service good, fair, or poor? Does your area support the air service? . Find out what changes in air service have occurred in your area. What caused the changes in the service? . Could your area receive better service if it were to be serviced by smaller, more economical planes? Would economies result from larger planes with greater capacity?	. Contact the airport manager of the airport serving your area. . Contact a business representative. Ask him how adequate air service in your area is. . Ask a representative of your local government about air service in your area.
- Scheduled Airlines claim that Supplemental Airlines have cut heavily into their profits by competing on lucrative routes at peak travel times.	. Does your area have supplemental air service besides scheduled air service?	. There are two kinds of air carriers, Supplemental Airlines and Scheduled Airlines. Supplemental Airlines are a class of nonscheduled carriers which perform charter services supplementary to scheduled airline service. Scheduled Airlines are lines which perform specified service at specified times over specified routes. . The airport manager of the airport serving your area
- The Supplemental Airlines claim that the Scheduled Airlines have suffered their losses on the domestic routes and not on those routes where they are competing. They claim the problem lies with escalating costs,	. Is your area considered a profitable air service area? . What factors make one area of the Nation profitable for airlines and another area not?	

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
over-expansion of fleets, the national economic slow-down, and excessive fare depletion.	. Discuss the air needs of your locality and how better service could be provided. . Do consumers add unnecessary costs by "overbooking"? (booking passage on several lines to be sure of transportation on one) Do "no-shows" (people who reserve seats but fail to appear) add to costs?	. *The Annual Report of the U.S. Scheduled Airline Industry,* The Air Transport Association of America, 1000 Connecticut Avenue, N.W., Washington, D.C. 20036 . Information on Supplemental Airlines can be obtained from: National Air Carrier Association, Inc., 1730 M Street, N.W., Suite 710, Washington, D.C. 20036
. Many airlines have been flying scheduled routes carrying unprofitable payloads. - In 1970, scheduled airlines flew 6,304,982,000 more passenger miles than in 1969, but enplaned 2,226,000 fewer passengers for a net loss of well over $100 million. - Domestic trunk traffic declined 2.4 percent for the first quarter of 1970.	. Using the *Annual Report of the U.S. Scheduled Airline Industry,* discuss why a decline in passenger traffic has occurred. List the reasons suggested by students for the decline and have the students suggest solutions to the problems. Send a copy of the list and suggested solutions to the Air Transport Association and ask them to comment.	. *The Annual Report of the U.S. Scheduled Airline Industry,* The Air Transport Association of America . Farris, Martin T. and McElhiney, Paul T., *Modern Transportation: Selected Readings,* Houghton Mifflin Company, Boston, 1967, part I B

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. According to most people in the airline industry, the public has demanded better service, more luxuries, and more comforts.	. Obtain copies of airline advertisements from magazines and newspapers. What do they emphasize: service, movies, comfortable seats, food? Discuss what the purpose of airlines is. Do the ads indicate that the purpose of the airlines is being emphasized?	. Magazines and newspapers can be obtained at home or in the school or town library. . Contact the airlines and ask for copies of their promotional advertising material.
- At the same time that competition and inflation have cut profits of the Scheduled Airlines, the flying public, we are told, is demanding more service.	. We say that the public is demanding more service. Is the public really demanding such service? Will the public not support the airlines if less comfort and fewer luxuries are offered? Is this demand made by the traveling public or created by promotional people to develop better advertising business?	
- Many of the flying public are turning to the nonscheduled airlines, when possible, to get cheaper rates.	. Most nonscheduled airlines do not offer as many services as do the scheduled airlines. Why do many people turn to the nonscheduled lines? Does this fact support the idea that the public is demanding newer and improved airplanes and more luxury?	. Contact a major airline and ask for evidence that the public is demanding more services, more comfort, and luxuries.
- Since profits are down, airlines are cutting expenses.	. Ask a representative of the airlines where expenses are being cut. Are airlines cutting in the logical areas of expense?	. Many carriers are cutting flight schedules to eliminate unprofitable flights and reduce uneconomical competition. As a result, in May 1971, there were 5.2 percent fewer

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		domestic flights scheduled than in May 1970. • To save money, many carriers are now cutting down on some of the "extras" to which passengers are accustomed.
. Physical facilities are not adequate to meet the demand. - Some air facilities are so crowded at peak times that reasonable service is not available.	. Ask your local airport manager if your local airport is capable of handling the business it has. Could it handle more efficiently? . Take a field trip to the local airport to find out about the facilities. - Does your airport have all-weather landing instrumentation for improved safety? - Do jets land at your airport? - What special problems do jets cause? - If there is no airport serving your community should one be built? - Is there need for rebuilding or enlarging your airport? - If rebuilding or enlarging is planned, what plans are being made for greater efficiency, better land usage, improved passenger control and handling?	. Some airports, such as Kennedy International in New York City, are so busy that often planes are held up many minutes for takeoff or landing permission. . See illustrations XIII and XIV.

ILLUSTRATION XIII

Sometimes barely adequate for today, much less tomorrow

"Crisis-Transportation," courtesy of the Caterpillar Tractor Co.

ILLUSTRATION XIV

Delays in getting to and from airports
and in handling baggage add to travel time.

Comparative Travel Time

Downtown to Downtown	Miles	Total Time		Total Cost	
		Driving	Flying*	Driving**	Flying***
Toledo — Detroit	59	1 hr 15 min	2 hr 50 min	$ 6.49	$31.75
Milwaukee — Chicago	86	1 hr 30 min	2 hr 25 min	9.46	25.15
Sacramento — San Francisco	90	1 hr 30 min	2 hr 20 min	9.90	20.66
Cincinnati — Indianapolis	105	1 hr 45 min	2 hr 46 min	11.55	26.95
Cleveland — Pittsburgh	131	2 hr 15 min	3 hr 5 min	14.41	29.95
New Orleans — Mobile	147	2 hr 45 min	2 hr 20 min	16.17	30.45
Boston — New York	213	4 hr no min	3 hr 5 min	23.43	31.95
Toronto — Detroit	233	4 hr 15 min	3 hr 35 min	25.63	36.55
New York — Washington	240	4 hr 15 min	3 hr 35 min	26.40	43.20

*Includes cab to/from downtown, waiting and checking time before flight, baggage delay following flight.
**@ 11¢/mile.
***Includes cab fares and tips.

Does not include stack up time or delays. Add 30 minutes to all flights in bad weather, 2 hours during traffic control slowdown, 8 hours if flight is canceled.

"Crisis-Transportation," courtesy of the Caterpillar Tractor Co.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Some airlines have canceled or stretched out orders for new flight equipment because business does not warrant the expense.	. Do larger and newer airplanes generate more business or do they only add to rising costs?	. Ask a representative of the airline industry.
ARE AIRLINES USING THEIR EQUIPMENT AND LABOR MOST EFFICIENTLY?		
. Scheduled airlines are required by the Civil Aviation Board to give service to specified localities. Many airlines continue to use expensive, large planes on small-demand routes instead of matching the equipment to the demand. The franchise for these lines often dictates the type of equipment to be used on a particular route.	. If you live in an area where air service is poor or nonexistent, could STOL provide better air service?	. Proposed STOL Service (Short Takeoff and Landing) using small capacity planes might be used as a commuter-service. Such planes can land on short airstrips (2,000 feet) or can meet small-demand service, since planes carry small passenger loads, have small crews, provide few comforts, and, overall, operate inexpensively.
- Small capacity planes might be the answer to the problem of uneconomic air service in low demand areas, where present regulations require large-capacity planes.	. What type of plane is required by the franchise of the airline serving your area?	. *For Quick Hops Between Big Cities - Look at Canada's Plan*, U.S. News and World Report, June 7, 1971, p. 76

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
DOES THE LACK OF UNIFORM RATE SCHEDULES OF INTERNATIONAL TRAVEL CREATE UNFAIR COMPETITION?		
. Several of the airlines licensed in foreign countries charge lower rates than do airlines licensed in the U.S.	. What does it cost to fly round trip to Europe? Does it make a difference if the airline company is foreign or American? . Contact a travel agent for price comparisons. Ask the agent about group fares, vacation fares, youth fares, off-season fares, etc. Make a bulletin board display comparing prices and services offered on trans-Atlantic or trans-Pacific flights.	. Different rate schedules exist in the international travel field. These rate differences exist because of the many different classifications for travel. Trans-Atlantic rates between New York and London may vary from $150 for special group rates to $800 for first-class round trip. Supplemental Airlines charge different rates for charter line flights than Scheduled Airlines do for scheduled flights.
WILL THE MORE MODERN AND LARGER PLANES SOLVE THE PROBLEMS OF THE AIRLINES?		
. Some observers believe that the [illegible], larger airplanes will not attract new passengers but only add to the airline capacity and financial headaches. Note: - the supersonic transport (SST) controversy - McDonnell Douglas' DC-10 - Lockheed's Tri-Star 1011.	. Ask a representative of the airline industry why the supersonic airplanes are considered by many to be the answer to the airline problem and by others as compounding the airline problem. . Ask the public (friends, family, and neighbors) what they think about the larger superairplanes. Based on the answers of friends, family, and neighbors, hold a class discussion	. Contact an airline serving your local area.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	to allow the students to share the information they have gained.	
. These new aircraft, both subsonic and supersonic, represent a commitment of more than $4 billion to be spent by the airline industry between 1971 and 1974.	. Do the airline companies feel that larger, more expensive planes are the answer to their problems? Why?	. Contact the Air Transport Association of America.
COULD A BETTER INTEGRATION OF AIR, LAND, AND WATER TRANSPORTATION SYSTEMS HELP SOLVE THE AIRLINES' PROBLEM?		
. Regulatory laws and agencies have prevented, to a limited extent, full integration into true transportation systems.	. Contact the ICC, the CAB, and the Justice Department to find out what regulations might have to be changed to create better integration.	. Contact the Interstate Commerce Commission, the Civil Aeronautics Board, and the Department of Justice, all in Washington, D.C.
. Integration of all transportation systems might eliminate some of the financial problems of the airlines.	. What do the students think could be done to bring about such integration?	. See the *National Transportation Policy: Preliminary Draft of a Report Prepared for the Committee on Interstate and Foreign Commerce.*
	. How might airlines help develop a better-integrated transportation system for this country?	. The Metropolitan Transportation Authority is attempting to develop an integrated transportation system for New York City. The measure of success in this urban center will undoubtedly be a major test of integrated systems.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT EFFECT DOES AIR TRANSPORTATION HAVE ON THE ENVIRONMENT?		
. The pollution problem faces the aircraft industry in the form of air, water, and noise pollution. - The charge has been made by ecologists that the SST will pollute the upper atmosphere, resulting in adverse changes in the climate. - The charge is made that the SST and many subsonic planes will create intolerable noise in the vicinity of the airports.	. Have the students develop a debate over the SST. Much material was prepared and heavy pressure was exerted by both sides in the SST debates of 1971. Introduce the point that even if American companies do not produce the plane, foreign manufacturers may do so and that some form of the SST will probably be flying over the U.S. in any case. . There is a saying that "there is no free lunch" - meaning that everything in life has a price. What price in noise, air, and water pollution are consumers prepared to pay for speedy, inexpensive, convenient air transportation?	. The industry claims that the SST would contribute no significant additional pollution to the world's atmosphere. . Aircraft contribute about 1.2 percent of all emissions nationwide. The advanced technology jets - 747, DC-10, and L-1011-are virtually smoke-free. . The 747, DC-10, and L-1011 are considered by some experts to be quieter than many of today's smaller jets. . The industry claims that takeoff and landing of the SST will be quieter than today's jets. The problem is with sideline noise. The industry claims it has already reduced sideline noise considerably and can do even better in the future. . *The Supersonic Transport Fantasy and Fact*, prepared by the Aerospace Industries Association - The Air Transport Association of America, 1000 Connecticut Ave., N.W., Washington, D.C. 20036

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The inefficient use of air terminal space has in some cases caused a marring of the landscape and often created nearly useless runway networks.	. Invite a representative of a consulting engineering firm or an airport architect to talk to the class about design and function of new air facilities.	. Contact a local consulting engineering firm and ask for an engineer who specializes in airport design.
- The jet port operation in the Everglades was stopped by the Department of Transportation because of a threat to the ecology of the area.	. Have a representative of an environment group or a teacher who is either concerned or teaching in the environment area work up a debate with your students on the Ecology vs. Progress theme and center discussion around the air traffic industry.	. The Everglade Jet Port runway was built but is nearly abandoned except for its use as a jet-training strip. . The magazine Environment and other such ecology-oriented publications are good sources of information.
- The plan of The Metropolitan Transportation Authority to use former Stewart Air Force Base as a fourth jet port for New York City raises some questions because of the distance from the city and the potential market vs. the development expense.	. Write to the Metropolitan Transportation Authority to obtain plans for Stewart Air Force Base. What are the opinions of the students on this projected expenditure of many millions of dollars?	. Metropolitan Transportation Authority, 1700 Broadway, New York, N.Y.
. Some observers advocate that transportation terminals should be developed as a central point for <u>all</u> forms of transportation as part of an integrated transportation system.	. Ask students what advantages or disadvantages they believe such an integrated terminal would establish.	. See illustration VI. This is a proposal by the Metropolitan Transportation Authority called a Transportation Center. . *Building a Better Aviation System,* Air Transport Association of America, 1000 Connecticut Ave., N.W., Washington, D.C. 20036

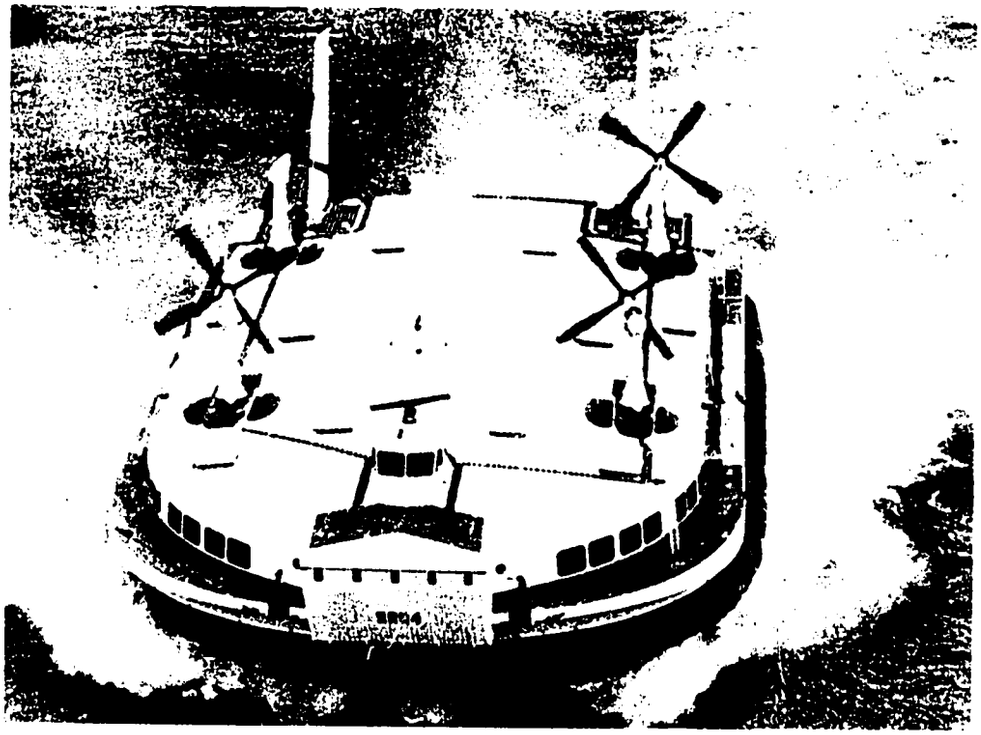
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Other observers feel that such a central terminal to include air travel is most unlikely. They point out that an airport terminal will never be central and that such integration is not likely nor desirable. Other modes of transportation will continue to serve the central business district. Linkage between airports and urban and intercity transport modes is, they claim, the key to this integration.	**Airport Access** **LIRR Service to John F. Kennedy Airport** This proposed link is of vital importance because of its profound effect upon the future of the city as an international, commercial, financial and transportation hub. JFK Airport has become almost impossible to reach by highway in peak periods, a situation that will worsen in the coming years. Larger aircraft carrying up to 500 passengers are scheduled to go into service in the near future and will further overtax existing ground transportation facilities. Nearly 20 million passengers used Kennedy Airport last year, and this number is expected to double by 1975. Further, the airport as an employment center continues to grow in importance. There are more than 35,000 jobs at JFK now, and estimates indicate this number will double in the next 15 years. Construction of a new direct rail link is recommended from the LIRR Atlantic Branch, running some three and a half miles to the terminal area, in order to insure the continued viability of the airport. This link will permit dependable, frequent and convenient service from midtown Manhattan (approximately 20 minutes) with the additional potential of attracting airport users from Queens, Brooklyn and Long Island points via Jamaica. Detailed alignments of this route have not yet been determined.	*Metropolitan Transportation - a program for action*, Metropolitan Transportation Authority 1967
CAN WATER TRANSPORTATION PLAY A GREATER ROLE IN MEETING OUR TRANSPORTATION NEEDS?		
. Water transportation is the cheapest way to move goods. However it has the disadvantages of being slow and of being largely limited to existing canals, lakes, rivers, and seaways.		. Ruppenthal, Karl M., and McKinnell, Henry A., Jr., *Transportation and Tomorrow*, Graduate School of Business, Stanford University, Stanford, 1966, ch. X.
- Waterways provided the necessary transportation routes for the development of much of our country.	. Make a pictorial study of water transportation showing the importance it has played in the industrial development of our Nation. The study should run from the time of exploration to the present. It should include ocean, river, and canal travel.	. Your school library, magazine pictures, files of your history department

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	. What is the cost per mile of building a canal such as the St. Lawrence Seaway? Is this expense worthwhile? What is the cost of maintaining a mile of existing canal? In what ways do such canals benefit consumers?	. St. Lawrence Seaway Development Corp., Massena, New York 13662
. Waterways remain an important method of transporting heavy or bulky freight at low cost.	. Have students list products they have seen moved by water. The list might include: oil, building materials, grain, scrap metals, refuse, coal, etc. What might be the effect on consumer prices if such material had to be moved by truck or rail?	
. There is a declining use of water for passenger transportation, except for pleasure, because of the slowness and some problems caused by the particular climate. . New technology in water transportation might ease some of the problems of transportation. - Commuter service by "Hovercraft" and hydrofoil has been tried around Manhattan.	. Do you now or have you ever had a water transportation network in your area? If you do, how important is it to your area's economy? . If the system no longer exists, what happened to it? If you live near a waterway, what consideration is given to new methods of water transportation in your area? Could high speed boats be used in your area? How?	. New York State Department of Transportation, Waterways Maintenance Subdivision, State Campus, Albany, N.Y. 12226 . Hellman, Harold, *Transportation in the World of the Future*, M. Evans and Company, Inc., New York, 1968, ch. 8

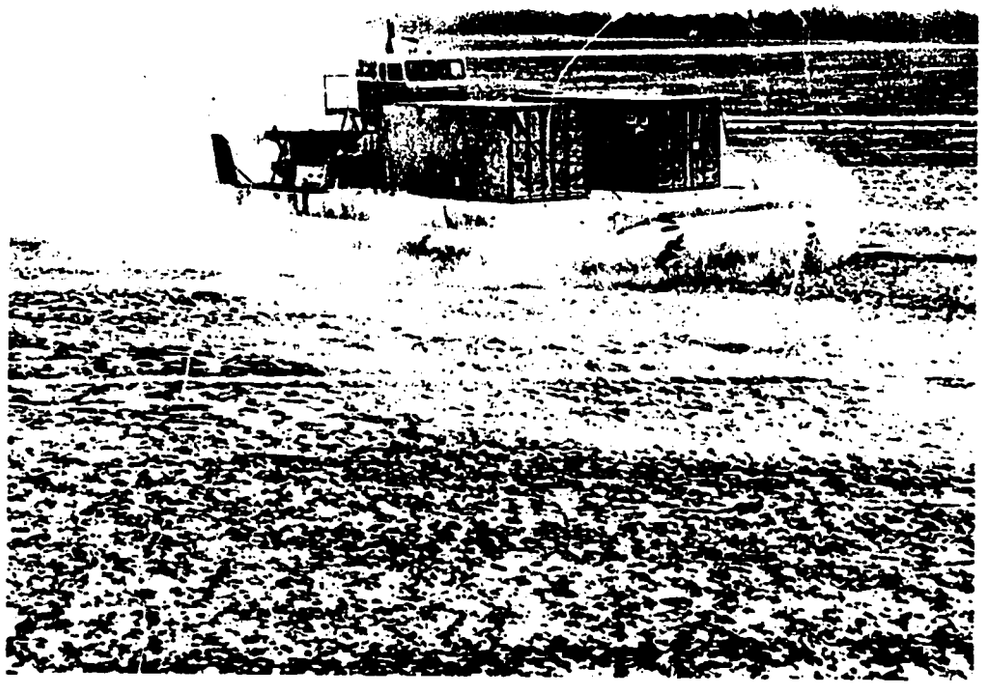
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The "Victoria" ferry between Seattle and Victoria, British Columbia, is a high-speed hydrofoil.		. Northwest Hydrofoil Lines, Inc., Joseph Vance Building, Seattle, Washington 98101
- High speed passenger water transportation could be developed for intercity transportation on the Great Lakes, the Hudson, the Mississippi, the Atlantic Coast, and other waterways of the Nation. Presently most water traffic handles large-bulk, low-value goods where speed is not important. However, our technology is such that high speed water transportation of people can be, and in some areas is, available. The biggest problem to be overcome is the present attitude that water transportation has very limited potential.	. Contact the U.S. Department of Transportation and ask what consideration is being given to high speed water transportation. . If possible, take a field trip to the closest water transportation center such as the St. Lawrence Seaway, Port of Oswego, Albany, or New York City. - What problems exist that greater use of water transportation might solve? - What problems exist that prevent greater use of water transportation?	. United States Department of Transportation, Washington, D.C. 20590
- In areas where ice is a major problem, ice breakers and giant air bubble equipment may be used to keep the waterways open.	. Ask the managers of various ports in the northeastern United States what they do to keep their ports open all year.	. Contact the managers of ports such as Albany, Oswego, New York City, etc.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The research and development of the Air Cushion Vehicle (ACV) indicates that such vehicles are a possible form of future water travel.	. For those ports that are not open all year, what advantage would a device to keep the port open offer?	. Pelee Island, Ontario, has petitioned the Province of Ontario to develop an ACV service between the island and the mainland because the island is isolated after the winter ice forms. . See illustrations XV, and XVI. . Bell Aerosystems Company, Division of Textron, P.O. Box 1, Buffalo, New York 14240
. New regulations and further precautions may be necessary to prevent water pollution from oil spills, accidental bilge discharges, etc.	. What regulations exist to restrict pollution of our waters? How effective have they been? Do those students who live on waterways note any improvement in the waters of their areas?	. The regulation and control of the navigable waters of the U.S. are under the supervision of the Army Corp of Engineers. . Office of the Chief of Engineers, Army Corps of Engineers, The Pentagon, Washington, D.C. 20310 . In some areas, such as the Hudson River, the Coast Guard is involved in any problem that has to do with pollution. . New York State Department of Environmental Conservation, Albany, New York 12205

ILLUSTRATION XV



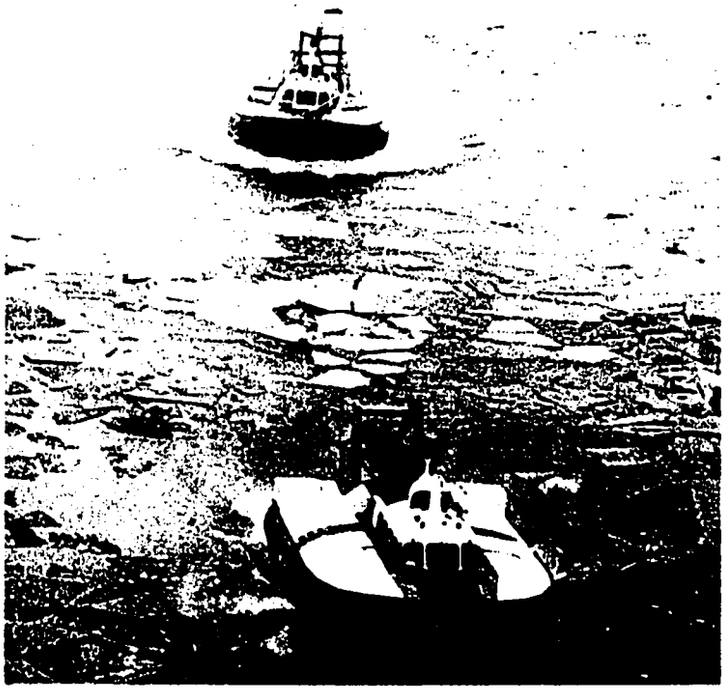
SRN4, the world's largest hovercraft



Voyageur heavy haul air cushion vehicle

Courtesy of Bell Aerospace Division of Textron Inc., Buffalo, New York 14240

ILLUSTRATION XVI

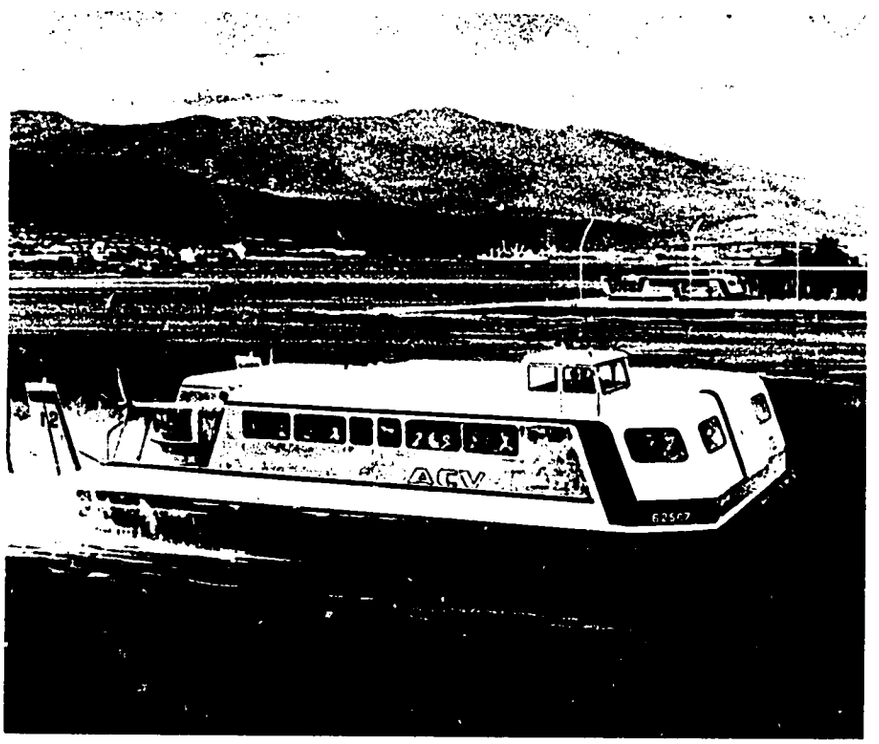


Icebound Lake Erie presents no problem.

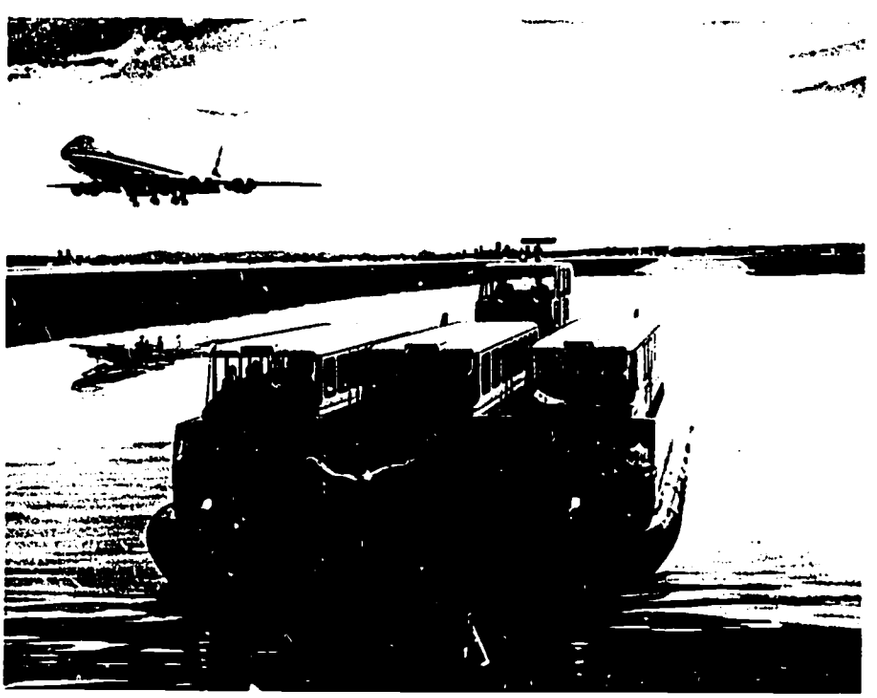
San Francisco Bay was the scene of a
Surface Effect Vehicle transit experiment.

Courtesy of Bell Aerospace Division of Textron, Inc.

ILLUSTRATION XVII



Surface Effect Vehicles can transform waterways into free superhighways.



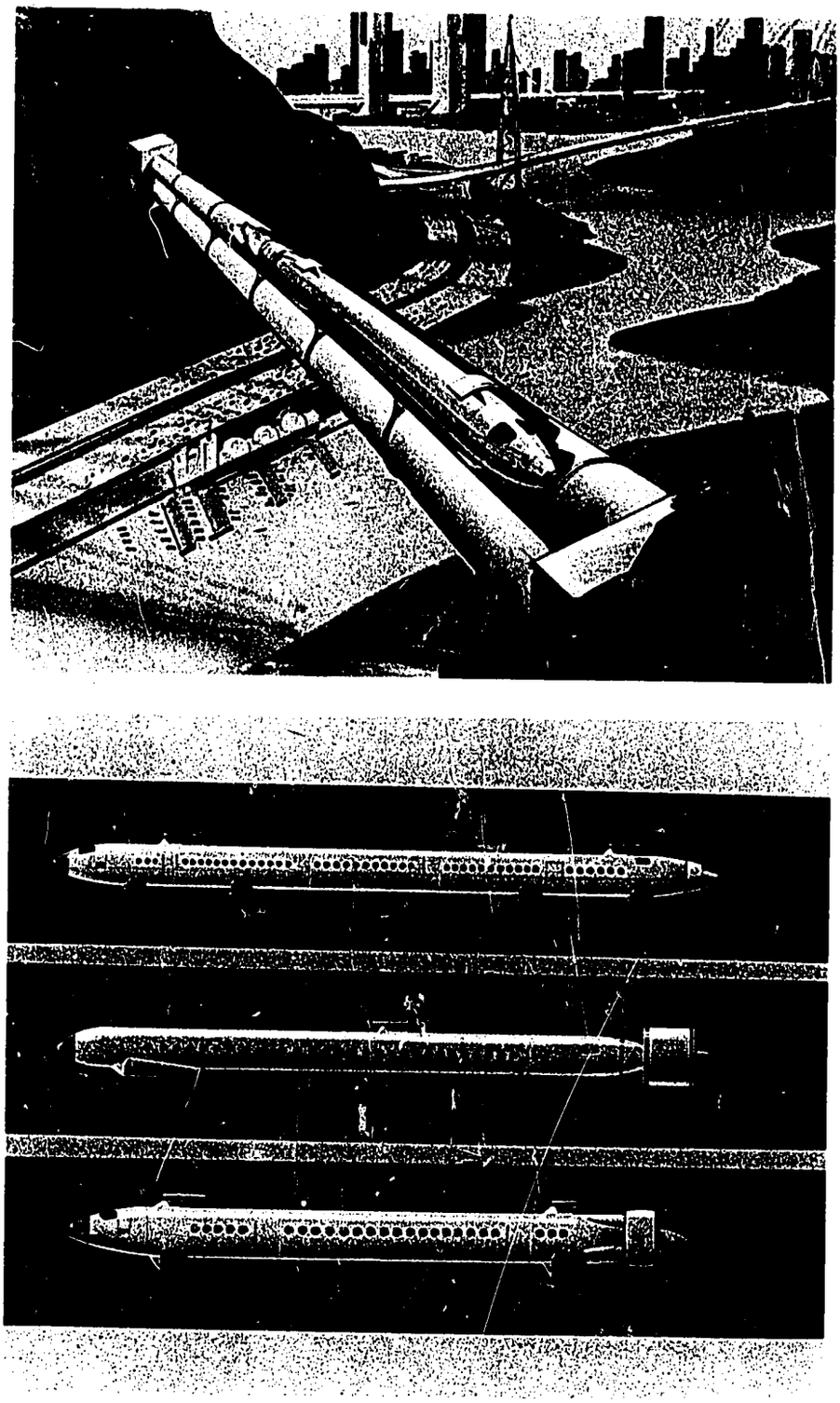
The unitized bus Surface Effect Vehicle transit system
Courtesy of Bell Aerospace Division of Textron Inc.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. Better coordination of water, land, pipeline, and air transportation systems could benefit all consumers.	. Contact New York State Department of Transportation and ask what efforts are being made to achieve better coordination in transportation systems.	. New York State Department of Transportation, Albany, New York 12226
HOW IMPORTANT IS PIPELINE TRANSPORTATION?		
. Pipelines perform a vital and important function in moving commodities cheaply and efficiently. Consumers benefit from this economical transportation method.	. Is your area served by a pipeline? - natural gas - oil - water - sewage	. Contact the local government officials to find out about water and sewage lines.
	. What effect do pipelines have upon your way of life? What would happen if all pipelines in your community ceased to function?	. Contact the utility company to find out about natural gas lines.
. The transportation of "energy" is the sole function of oil pipelines.	. Ask a representative of Niagara Mohawk, New York Gas and Electric Co., or some other company to discuss advantages, dangers, and problems of gas pipelines.	. Transportation by pipeline is economically feasible only for the long-term movement of large quantities of material between two established points.
. Research is being done on use of pipelines for the transportation of other objects.	. If there is a gasline, waterline, or sewage project underway in your area, a visit to the project might help the students understand the technology of pipelines.	. The typical long-haul pipeline rate via a modern, efficient carrier is now 10 to 20 percent of the cost of transport by rail, the next lowest-cost overland carrier. Within the past few years, crude oil pipeline tariff rates have become competitive with, and in some cases, below barge costs. The rates for the 36 inch Colonial line system — Houston to New York — match medium tanker rates.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	. Contact a major pipeline company and obtain information about pipelines, including new developments and future plans.	. AMOCO Pipeline Company, P.O. Box 6110-A, Chicago, Illinois 60680
- Movement of solids, such as coal, in slurry form is now being successfully accomplished.	. Are there industries in your area that use pipelines for the purpose of moving manufactured items? - A paper mill uses a pipeline to move pulp from the pulp mill to the paper machine. - What problems does industry have using pipelines on a small scale? Would problems be of greater magnitude if use were on a larger scale?	. If you have a paper mill in your area, contact the plant manager and ask what problems, if any, the plant has with their pipelines. . Ask a manager of a petroleum distributing center what problems they have with pipelines as well as what economies are effected by pipeline use.
- Tests have been run on sending steel capsules filled with wheat through a 20 inch crude oil trunk line using crude oil as the vehicle.	. Ask students to do some research on the use of pipelines and then ask them to be prepared to discuss their opinions on the greater use of pipelines for the transportation of marketable goods.	. AMOCO Pipeline Company and other pipeline companies
- Studies have been made to consider the use of idle pipelines for moving waste materials out of urban areas for disposal in worked-out strip mines or coal pits.	. Contact the city of Cleveland, Ohio, to find out the results of their studies, the problems encountered, and future hopes.	. Address request for information to the Office of the Mayor, Cleveland, Ohio 44114

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT POSSIBILITIES EXIST FOR THE MOVEMENT OF PEOPLE IN PIPELINES?		
. The movement of people in cars using ramjets, vacuum, or pneumatic power sources has been proposed and some experiments conducted. (People Pipelines)	. What do the students think of a People Pipeline (the use of Tube Flight)? . Obtain information about Tube Flight from the Department of Aeronautical Engineering and Astronautics, Rensselaer Polytechnic Institute, Troy, New York 12180, or Joseph V. Foa. . Have each student (regardless of artistic ability) draw a picture of what he thinks a people pipeline would be like.	. Some experimentation has been done by Joseph V. Foa, Department of Civil, Mechanical, and Environment Engineering, The George Washington School of Engineering and Applied Science, Washington, D.C. 20006 . See illustration XVIII. . During 1966 about 35 percent of all petroleum products sold in the U.S. were delivered by pipeline.
. The pipeline industry supplements air, land, and water transportation and should be part of a totally integrated system. . By combining tunnels and pipelines, the cost of rights-of-way can be shared.	. Do the students foresee increased use of pipelines as a more practical all-weather means of transporting additional commodities? . Contact a pipeline company, such as AMOCO, and ask what their future development plans are projected to accomplish.	. The Office of High Speed Ground Transportation of the U.S. Department of Transportation is studying the feasibility of a multiuse transportation and utility tunnel along the Northeast Corridor.

ILLUSTRATION XVIII



Diagramatic sketches illustrating use of capsules in pipelines

Rensselaer Polytechnic Institute, Troy, New York

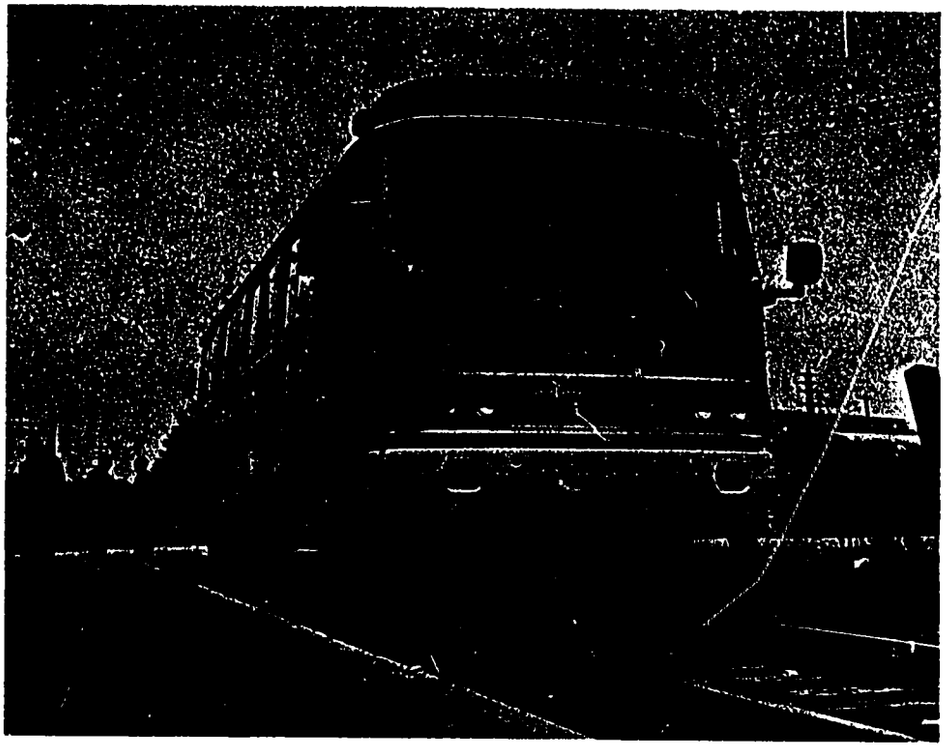
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
CAN THE CONSUMER LOOK HOPEFULLY AT THE FUTURE FOR ROADS, STREETS, AND HIGHWAYS?		
. Congested city streets are not a new problem.		. Julius Caeser was forced to ban wheeled vehicles from the center of Rome during the day because of traffic congestion.
. Cities were built during times when populations were less mobile; most cities were not planned to expedite traffic.	. Do you have some very narrow streets in your community? Do they have a history that would explain why the streets are narrow, such as dating from the days of your community's founding?	. Most cities experienced severe congestion even with horse-drawn vehicles.
. Opinions vary as to whether conditions are worse now than in years before, but everyone agrees that they are serious enough to require action.	. What is being done by your local officials to ease the traffic problem in your local community? Are they limiting traffic in certain areas of your community? Is motor vehicle traffic prohibited in the central business district? Is there a traffic master-plan for your community?	. Contact your local officials for information on your community traffic problems. . New York State Department of Transportation, Regional Office
. Worldwide production of motor vehicles is increasing three times faster than the increase in human population.		
. Modern technology is developing methods of designing and building roadways which hold promise of alleviating traffic congestion.	. Contact organizations or agencies that are concerned with highway technology. What new technological developments may improve highway construction and safety? What suggestion do students have for improved highways?	. New York State Department of Transportation, Planning and Research Bureau . Highway Users Federation for Safety and Mobility, 200 Ring Building, Washington, D.C. 20036

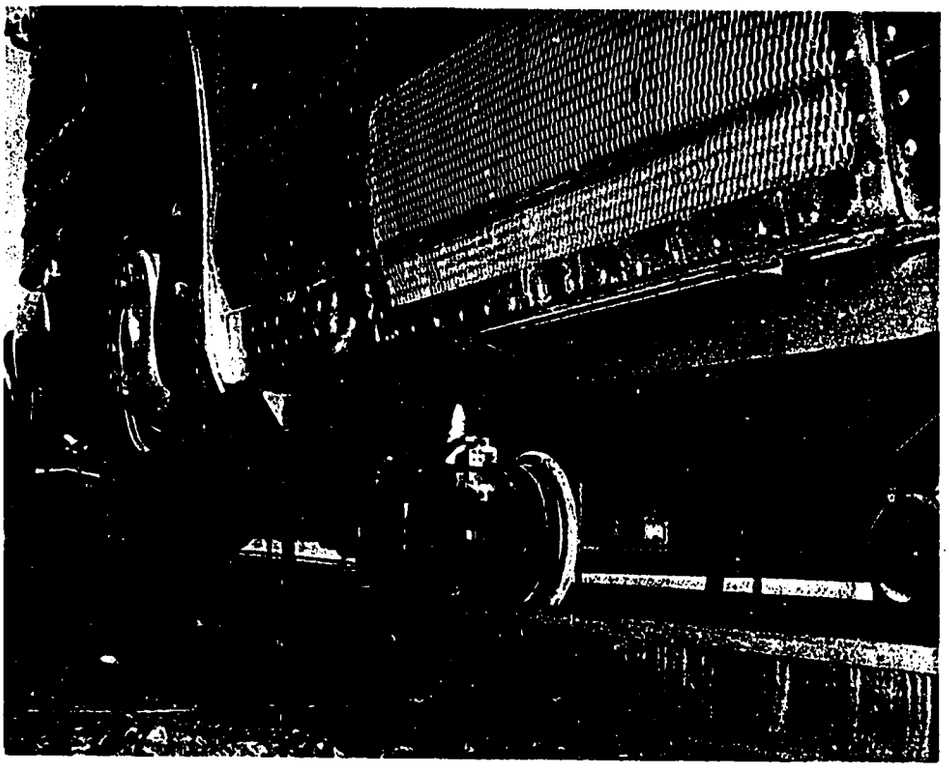
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		. *Highways to 1985 and Highways - Magnet For New Industry*, American Trucking Associations
- The freeway and expressway are roads specially designed to move a large volume of traffic safely at high speed.	. What is the purpose for the existence of freeways or expressways? What expressways are in or near your community? How effective are they in moving traffic at high speed? What problems do they create?	. The primary reason for the establishment of freeways or expressways is to relieve the inner city of through traffic. It is estimated that at least one third of all the traffic found in the central city is through traffic, using city roads because no bypass exists.
- Arterial routes are high speed highways within cities, designed to speed traffic from one part of the city to another.		. The high speed maintained on expressways is possible because of the controlled access features.
- Beltways (circumferential roadways) are purposely built to keep traffic out of the cities.	. Are any new bypass highways being built in your area? What effect will the movement of traffic around the city have upon business within the city?	.. Local officials
. The "use capacity" of our highways can be raised with the development of new forms of high speed roads.	. What ideas do the students have about how highway "use capacity" could be increased? - Have students make models or pictures to illustrate what their ideas are.	. General Motors presented a research paper to the Society of Automotive Engineers, January 1972, entitled *Automated Roadway Transportation System Configurations.* (continued)

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	- Ask a highway design engineer to meet with the class to discuss his own and student ideas. - Ask the art teacher to cooperate with your students to develop "artists' ideas" of what new high speed highways might be like.	This proposal described the "Metro Guideway" which is a multimode system of automatically controlled vehicles. Request from General Motors Corp., Public Relations Office, 3044 West Grand Blvd., Detroit, Michigan 48202 - Research Publication GMR 1140.
	. What studies have been made in your area on alternatives to building new superhighways?	. Contact your local officials. . Contact the New York State Department of Transportation, Regional Office.
- Monitored highways are considered by many experts to be the answer to better traffic control.	. Arrange with the New York State Police to demonstrate traffic control techniques to the class. Ask the representative to speak about State Police experimentation with monitoring State highways. . What evidences of monitoring of State highways have pupils observed: traffic control cars? aircraft patrols? other methods?	. In Detroit and on Chicago's Congress Street Expressway, monitoring of the traffic flow is taking place. Detroit's system uses television cameras which are placed every ¼ mile. When traffic reaches a point of "critical density," entrance ramps are closed and traffic is diverted to less congested alternate routes. Chicago's system is controlled by electronic sensors. Traffic flow is fed into a computer and when "critical density" is reached, entrance ramps are closed, thus diverting traffic to other routes.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Some method of quick obstacle removal is necessary to keep traffic moving smoothly.	. Ask a representative of the State Police to present a program for the class on problems related to high speed highways. Ask him to deal with problems caused by accidents on these highways. How is obstacle removal handled? What other methods of handling obstacles to traffic might help?	. An accident on a high speed highway is extremely dangerous because of a possible chain reaction which may not be directly related to the cause of an accident but might be a result of it. This problem could be partially eliminated if a rapid means of obstacle-removal such as a helicopter could be employed.
. As more and more cars are being built and more and more highway space is demanded, new and improved concepts of roadways are necessary. Among the possibilities are these: - automating the highway - G.M. "Autoline" - road/rail combinations - remote control lane-changes - computerized signal devices to warn cars about conditions ahead	. Have students contact the New York State Department of Transportation and the U.S. Department of Transportation to ask what work is being done to develop new methods for handling increased highway traffic. . Have a student contact Rensselaer Polytechnic Institute or Cornell University to find out what is being done in the field of traffic research. Among the topics to investigate are these: - traffic engineering improvements - turning movement and parking prohibition - synchronization of signals, etc.	. New York State Department of Transportation, Albany, New York . United States Department of Transportation, Bureau of Public Roads, Washington, D.C. . See illustration XIX. . Rensselaer Polytechnic Institute, Troy, New York 12181 . Cornell University, Ithaca, New York 14850 . Some of the highways in the New York metropolitan area use electric signs that notify drivers of speed changes and road conditions ahead.

ILLUSTRATION XIX





Courtesy of The Port of New York Authority

TODAY'S TRANSPORTATION AND ITS SOCIOLOGICAL PROBLEMS – SUMMARY

In this section,we have looked at the present transportation system in America. We have considered some of the problems that exist and the difficulties which face responsible leaders as they attempt to meet the sometimes conflicting demands of society.

America has made signal progress in developing a network of roads, waterways, railways, pipelines, and air routes unmatched by any other country. Nevertheless,this progress has still not solved all our transportation problems; indeed in some instances the progress has created new problems. One of the biggest problems of all is how we can reconcile the common good with the desire of almost every American to own one or more automobiles and to operate those automobiles to serve his own convenience.

As the population increases, as new wants and needs are created, and as we become more aware of the possibility of ecological damage, the importance of an efficient, safe, inexpensive, convenient way to move goods and people assumes greater importance. Just paving over more land, or increasing the number of trucks which travel our highways, or building ever-larger airplanes, or subsidizing railroads will not alone solve the problem.

What is needed, if we are to develop improved transportation, is that efforts of the entire Nation must be coordinated and the problem attacked in an intelligent manner. There must be improved relationships between Federal and State Departments of Transportation so the efforts made can be toward the same goals. Consumers must, through their elected representatives, help shape events to reach desirable ends.

The next section is concerned with how integrated efforts may be developed and how American attitudes must change to allow progress to be made in solving the transportation problem.

TRANSPORTATION OF THE FUTURE
POSSIBLE SOLUTIONS TO OUR TRANSPORTATION PROBLEMS

CORE THOUGHT

Solutions to the transportation problem cannot be provided unless there are integrated efforts by all levels of government, private industry, and individual citizens, coupled with a willingness to accept new practices which demonstrate merit.

* * *

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT INTEGRATED EFFORTS EXIST FOR SOLVING TRANSPORTATION PROBLEMS?		
. Cooperative efforts between Federal, state, and local governmental agencies are necessary. - The highway building programs are based on matching proportional funds. For example, state highways are financed both by Federal and state money; local highways are financed by state and local money.	. How much money has been received in your area from the State and Federal Government for highway construction and maintenance? Obtain a map of local roads and indicate on the map those that were built in the last decade or are maintained in part or in whole with State or Federal funds. . What would have been the effect on your local community if no Federal or State highway money had been available during the past 10 years?	. The local supervisor of highways or the highway department supervisor can give you information on your local community road financing. . The regional engineer of the State Department of Transportation can give you information on State highways in your area. . Depending on the area where construction is taking place, the Interstate Highway System in New York State is costing more than $1 million per mile.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The costs of rebuilding existing systems or building new transportation systems are so great that a broad base of financial support is necessary.	. Who really pays for the building of new highways, subsidizing bankrupt railroads, or building new subway lines? In general, is the public satisfied with the way such moneys are spent or do they think there is waste and extravagance?	. The consumer-taxpayer actually pays for our transportation systems and highway networks, directly or indirectly.
. Cooperation between states to resolve the transportation problem on a regional basis is necessary.	. Ask the New York State Office of Planning Services what economies, if any, might obtain if communities were to join together to provide essential services.	. The passage of the Federal Urban Mass Transportation Act of 1963 and the first New York State Transportation Bond Issue created funding for mass transportation programs in New York State.
	. To illustrate what can happen when the regional approach exists, have the students plan a metropolitan area of 100,000 people with six towns in the area. Each town would have a police and fire department, a highway department, a sewer and water department. Based on this plan, estimate with the help of local and State officials what the cost of fire protection, police protection, etc. would be for the entire metropolitan area.	. A local planning board or a regional planning board can supply information or give assistance. . New York State Office of Planning Services, Broadway Arcade Building, 488 Broadway, Albany, New York 12207 . Bain, Henry, *The Reston Express Bus*, Washington Center for Metropolitan Studies, 1717 Massachusetts Avenue, Washington, D.C. 20036

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
	Could each of these services be supplied at less cost to each town by eliminating duplication and approaching this problem on a regional basis? Could this same approach produce improved transportation systems?	
. Some examples of cooperative agreements benefiting consumers already exist. - The New York Port Authority is a cooperative effort between New York and New Jersey.	. What is the work of the Port Authority? . What problems can you think of that agencies such as the Port Authority might eliminate?	. The port of New York borders on both New York and New Jersey. The Port Authority was created to operate the port on a cooperative basis for both states. . New York Port Authority, New York, New York 10011
- New York State and Connecticut, working through the Metropolitan Transportation Authority and Connecticut's Transportation Authority, have taken over the New Haven division of the Penn Central railroad and are improving the commuter service.	. Commuter service on the New Haven had deteriorated badly prior to the Authority takeover. Have students study the recommendations of the Metropolitan Transportation Authority in the February 1968 report: *Metropolitan Transportation — a program for action.* How many of the recommendations have been carried out? What remains to be done?	. Metropolitan Transportation Authority, 1700 Broadway, New York, N.Y. 10019

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The Tri-State Regional Planning Commission was formed to examine and make recommendations for meeting transportation needs in the 8,000 square mile area running from New Haven, Connecticut, to Trenton, New Jersey.	. Study the work and activities of the Tri-State Regional Planning Commission. What have been the accomplishments of this commission?	. The states of Connecticut, New York, and New Jersey make up the Tri-State Regional Planning Commission. The commission is charged to make a detailed study of the region-wide transportation needs, recognizing a projected area population in 1985 of 23.5 million.
. Transportation needs can best be met at times by international cooperation. - The St. Lawrence Seaway Project was a United States and Canadian effort. - Since the Seaway involved international waters and large sums of money, it was necessary to pool the efforts of both nations to accomplish the purposes of the project.	. Obtain the movie *The Fourth Sea Coast.* . Obtain a copy of the Seaway Annual Report. . Contact the New York State Power Authority to discover the important role that New York State played in the creation of this international transportation project.	. St. Lawrence Seaway Development Corporation, Massena, New York 13662 . Power Authority of the State of New York, 10 Columbus Circle, New York, New York 10019 . The State of New York and the Province of Ontario cooperated in adapting the requirements of the Seaway to the production of hydroelectric power by building a hydropower dam to create the water storage basin to serve the seaway.
. Cooperation is underway between the United States and Canada to establish inexpensive air service to serve the more isolated, low-population areas of both countries. - The STOL air system may be an answer to this problem.	. Refer to your study of STOL in a previous section of this module.	. *For Quick Hops between Big Cities - Look At Canada Plan,* U.S. News & World Report, June 7, 1971, p. 76

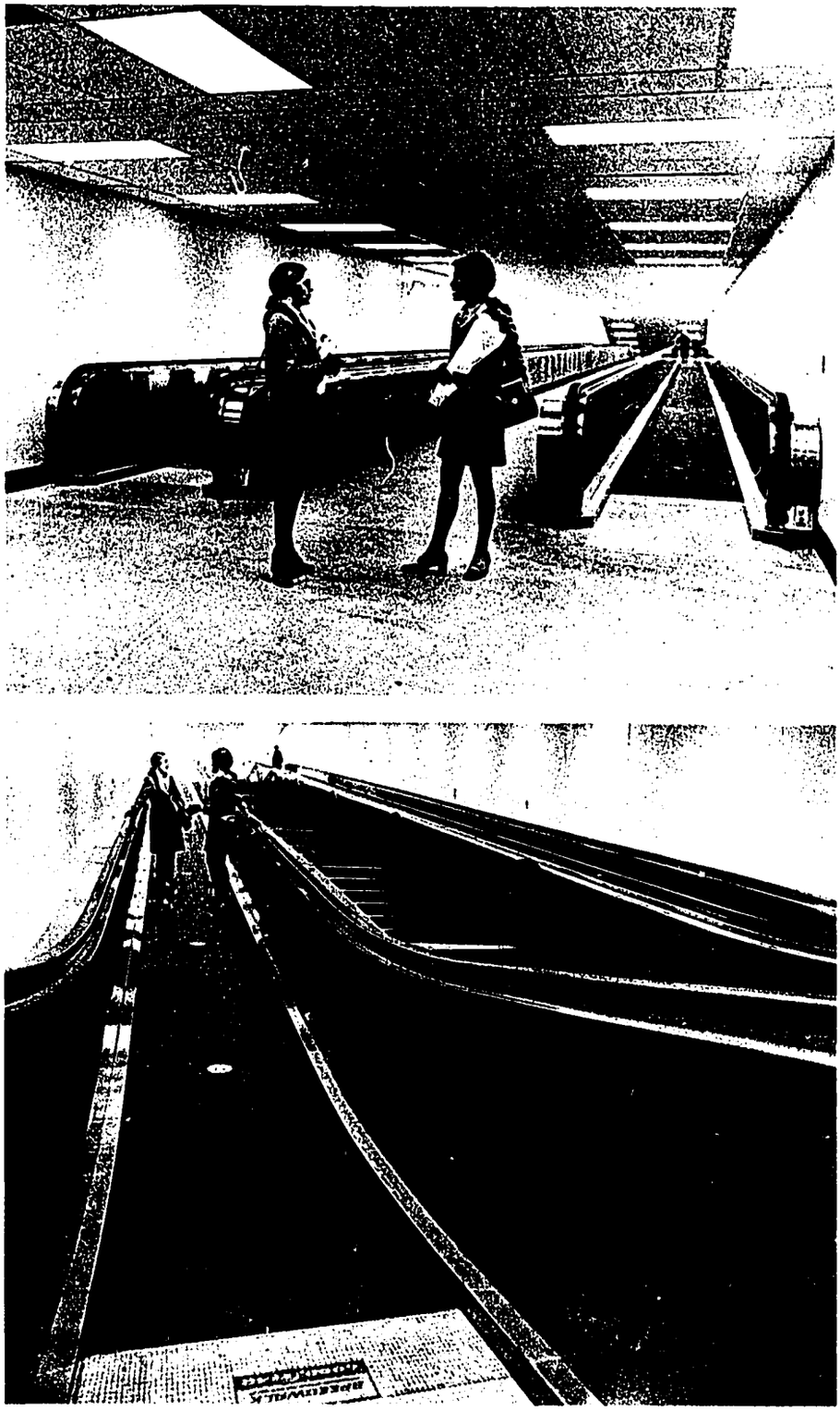
UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHY MUST ATTITUDES CHANGE IF SOLUTIONS TO OUR TRANSPORTATION PROBLEMS ARE TO BE FOUND?		
. The general public must decide whether it is willing to pay the cost of greatly improved transportation. - The costs are so large that a broad-based source of financing will be necessary if proposed solutions are to be achieved.	. Have students take role playing parts. Have an interviewer do a "man on the street" interview of another student. Question this student on his attitude toward public transportation. Is he willing to pay the necessary cost for better public transportation? The teacher and students should make up the questions for the interview based on what has been learned in this study. The student being interviewed should try to express the attitudes of the community. He should at least attempt to express what he thinks is the attitude of the class.	. The attitude of many people is that if they are not demanding the improved transportation or using the facilities they should not have to pay the cost. . Many argue that they are willing to pay but feel that greater efficiency and better planning is needed. . Some people feel that much money is wasted in the field of transportation and the return for their tax dollars is not as great as might reasonably be expected.
. The Federal Government feels that citizen participation is so important that it has made such participation a requirement for federally aided transportation facilities. (Guideline 90)		
- Special taxes such as gasoline or road taxes will probably be the prime sources of revenue.	. How much highway and gasoline tax is paid in New York State?	. New York State Department of Taxation, State Office Campus, Albany, New York 12226
- Bond issues for the sole purpose of financing extensive transportation projects are possibilities.	. How much money has been raised by the sale of transportation bonds in New York State in the last few years?	. Department of Audit and Control, Division of Investments and Cash Management, Alfred E. Smith Office Building, Albany, New York 12207

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- User fees such as are found on toll roads like the New York State Thruway are another possibility to raise money.	. How successful has the use of authorities such as the New York State Thruway Authority been? . Ask a local banker, school business agent, or other person familiar with finances whether authorities are good ways to handle the transportation problem.	. New York State Thruway Authority, P.O. Box 189, Albany, New York 12201
. The public must recognize that for private enterprise in the transportation field to exist a fair profit must be realized. - The public must realize that each demand for service and comfort has a price tag; unreasonable demands produce unreasonable costs.	. Ask a business management teacher or economics teacher to talk to the class on the principles of the free enterprise economy and what this means to business.	. A teacher from your business department or social studies department
. It may be necessary, in view of the problems of pollution and congestion, for consumers to forego the use of private automobiles in certain urban areas.	. If your school has a cassette tape recorder, have students do a "man on the street" interview in your business district. Have them ask the public what they expect in service and comfort from a transportation system. Would they be willing to pay extra for more services? Would they cease traveling by bus, train, or plane if they had to pay extra for additional services? Would they be willing to use their cars less and public transportation more, provided that <u>good</u> public transportation were made available? Why would they, or would they not, support public transportation in lieu of using their private cars?	. The general public . Sometimes the traveling public demands excellent service, and at the same time low fares — an unreasonable combination of requests. . Because it is convenient to do so, many people rely almost totally upon personally owned automobiles for transportation; however, greater efficiency, and far fewer problems might arise if we traveled by public means instead of by personal means.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
WHAT DOES THE FUTURE HOLD IN THE FIELD OF "PEOPLE MOVING"?		
. Ideas that seemed like science fiction a few years ago are today realities.	. Have students bring in some copies of science fiction books or comic books. - Are there things in science fiction today that we think impossible but may be possible tomorrow? - Have there been any developments in the science field within the lifetime of the students that might have been classed as science fiction a few years ago? (space travel, hydrofoil boats, air cushion vehicles, etc.)	. The Sunday comic section of the Sunday paper often has a science fiction comic section such as Flash Gordon. . The school library should have some good science fiction books. . Hellman, Harold, *Transportation in the World of the Future*, M. Evans and Co., Inc., New York, 1968
. New technology and materials have enabled developments to take place which seemed impossible. . "Jitney"-type automated "people movers," intended to carry people for somewhat longer distances than moving platforms, seem to hold promise.	. Ask the physics teacher to speak on new technology and materials that may make for revolutionary changes in transportation. What effect has space exploration had on the development of new technology and materials?	. Contact Rensselaer Polytechnic Institute, Cornell School of Engineering, or Massachusetts Institute of Technology for technological developments affecting transportation.
. Moving platforms and walks in high density areas, such as central business districts, might prove to be most efficient "people movers."	. Ask those students who ski or those who have ridden chair lifts, T-bars, or any other constantly moving device to relate what problems they or others have had riding such devices. . How effective do students rate the performance of escalators and automatic elevators?	. *Tomorrow's Transportation*, U.S. Department of Housing and Urban Development, 1968

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The Bouladon Integrator is one such device. It starts off as a wide, multiple escalator. Dividers separate the wide steps as the escalator moves forward, but it also begins to accelerate sideways to achieve speeds of 20 m.p.h. or more as the compartments move onto the high speed conveyor belt.	. If you have a student who is mechanical, ask him if he can make a model of a moving sidewalk or platform. . Obtain a pallet from a shipping company or other industry. Using a length of rope, tie the pallet to a car. Have the car pull the pallet at differing speeds. Have students try to get on the pallet at speeds of about 5 m.p.h. Then have the car pull the pallet at 20 m.p.h. (Do not allow students to get on the pallet at this speed.) What problems exist with the use of moving platforms or sidewalks? How might these problems be overcome?	. The problem with moving sidewalks, conveyors, and moving platforms is that they have to be very slow moving for people to be able to get on and off them safely. . There are two types of devices that use exclusive guide-ways and are fully automated: the dozen passenger, shared ride, "people mover" type, and the smaller, exclusive occupancy, "personal rapid transit" (PTR) concept.
- The Speedwalk Passenger Conveyor and Speedramp System are moving people in hundreds of installations in the world, such as at San Francisco's International Airport and Disneyland.	. Have pupils investigate the Bouladon Integrator, the Speedwalk Passenger Conveyor, the PTR "people mover" installed at Morgantown, West Virginia, by the Bendix Corporation, and the ACT System developed by the Ford Motor Company.	. For information on "people movers," see Popular Science, November 1971 . Write for *Automatically Controlled Transportation, A New Technology for Public Transportation,* Ford Transportation and Research Office, 23400 Michigan Avenue, Dearborn, Michigan 48124.

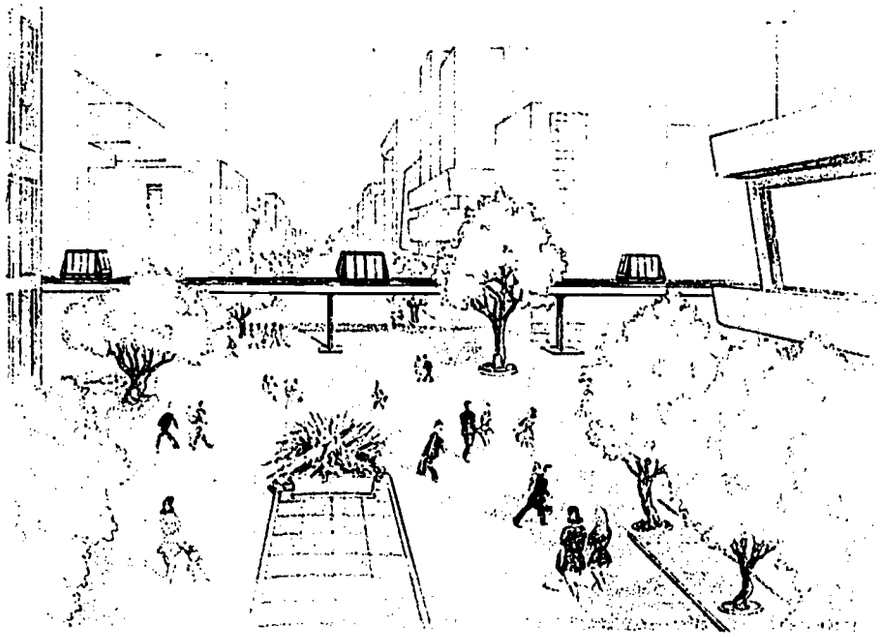
ILLUSTRATION XX
Moving walks — horizontal and lifting



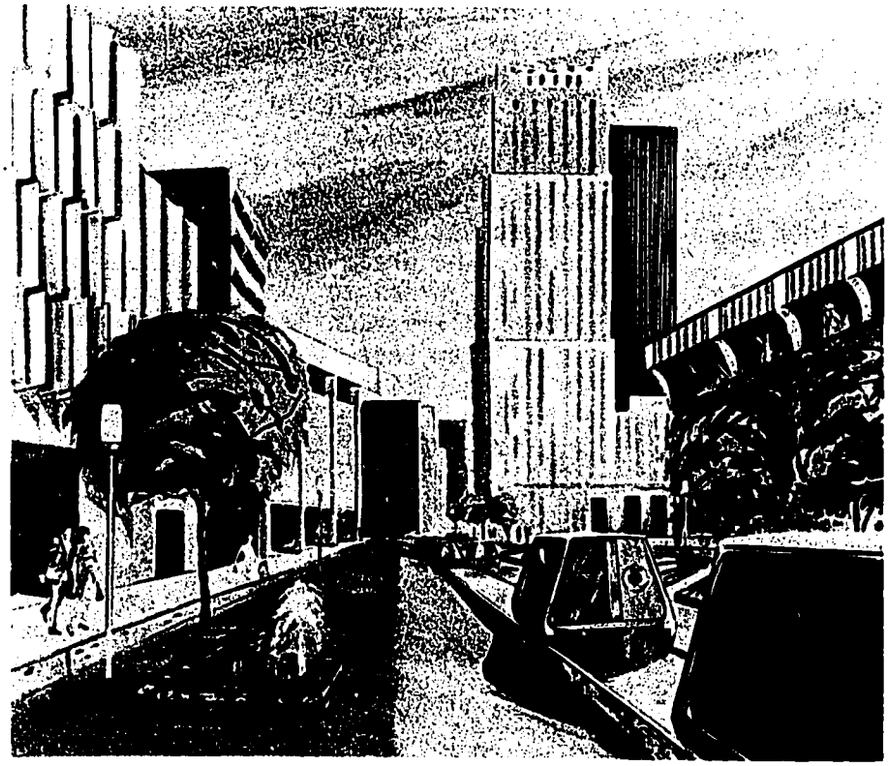
Courtesy of Transportation Systems, The Goodyear Tire and Rubber Company

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The Goodyear People Mover is a fixed-route transportation system in which small cars are used. The cars have no motors, but the roadway moves. The objective is automatic processing of passengers. The cars run continuously at speeds ranging from 7 m.p.h. to 1½ m.p.h. at boarding and unloading areas where synchronized revolving transfer platforms enable passengers to get on and off easily while the entire system continues to move.	. Request information about the Goodyear People Mover from the Goodyear Rubber Company. - Do the students think that such a system could be useful locally? - In what ways could the People Mover solve some local problems?	. The Goodyear People Mover is in operation at Disneylands' Tomorrowland. A new variation of this system is planned at Disney World in Florida and for the High Sierra Development in California. . Goodyear Tire and Rubber Company, Inc., 1144 East Market Street, Akron, Ohio 44316, Att. Robert H. Lane, vice president of public relations
- The Goodyear Tire and Rubber Company proposes the "Carveyor." This is proposed to run from "fringe area" parking facilities to the downtown areas using a system like the Goodyear People Mover but employing small cars in which people could ride.	. If central business district transportation systems such as the "Carveyor" were put into operation, how would they affect the area served by this system? - What do the students believe would occur in the business districts? - What is the students attitude toward eliminating automobiles from the central business district?	. See illustration XXI. . Contact cities, for example, Rochester, New York, which have put in shopping malls and have moved traffic lanes to discover what the effect has been.

ILLUSTRATION XXI



Proposed CARVEYOR (people mover) mini-distance transportation system serving downtown (below) and passing through business complex on overhead guideway (above)



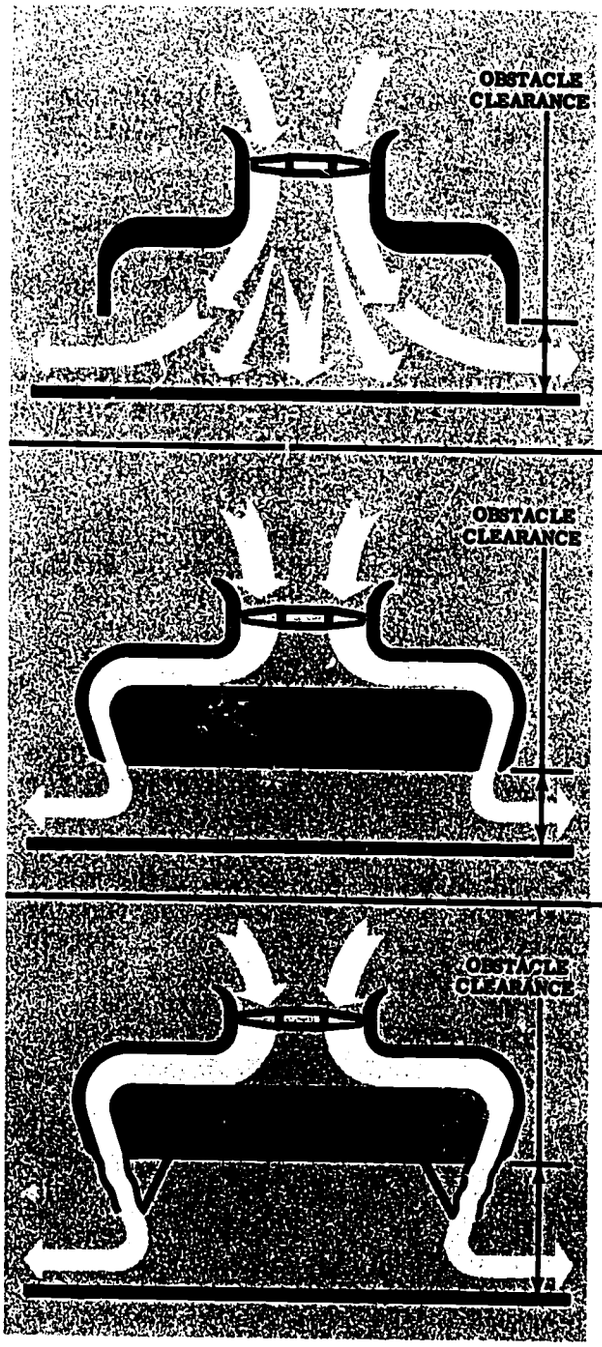
Courtesy of Transportation Systems, The Goodyear Tire and Rubber Company

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. It has been suggested by Constantinos Doxidos, famed city planner, that all metropolitan surface transportation must eventually go underground.	. Contact Dallas, Texas, and find out what their plan is. . Have a student with artistic ability draw a picture of what he thinks such a business district would look like with traffic underground and a pedestrian mall in place of streets.	. The Dallas, Texas, city council has approved a plan to move its central business district traffic underground and make the surface area into a pedestrian mall. . New technology has developed methods of tunneling and solving problems which might occur in such an underground system.
. Automated highways might ease the traffic problem on the highways by increasing the vehicular capacity per hour. Examples of both true automated highway devices and dual mode concepts are: - G.M.'s Automated Roadway - The Alden Sta R R car - The Urbmobile - Fuller's Traveling Cartridge These are all proposed as automatic systems to increase capacity, reduce air pollution, increase speed to destination, and at the same time offer door-to-door transportation and convenience. - The proposal has been made to combine automatic	. Many students have a good imagination and can, with encouragement, develop creative ideas. Ask the students to consider different approaches to highway travel. These students should be encouraged to write to automobile manufacturers, other companies, or creative people who dream up new appraoches to old problems such as William Lear, Lear Jet Corporation, P.O. Box 1280, Wichita, Kansas 66601.	. See the section on land usage, pp. 23-25. . Automated highway proposals have received some testing. The theory behind them is basically good, but further study of such systems needs to be carried out. . Hellman, Harold, *Transportation in the World of the Future*, M. Evans and Co., Inc., New York, 1968 . Massachusetts Institute of Technology received a Federal grant to experiment on such an automated highway system plan.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
highways and small electric buses to provide door-to-door, demand-activated service.		
. Much experimentation has been done with ACV (Air Cushion Vehicles). Most of the work has been with the use of such vehicles over water, but land usage is also very possible. - France's Bertin Aerotrain - England's Hovertrain - United States's General Motors Hovair	. If your physics department is equipped to do so, construct a model of an ACV to see how the principle of the air cushion works. . Contact the Bell Aerosystems Company to find out more information about transportation possibilities using Air Cushion Vehicles.	. See illustrations XXII and XXIII. . The Bertin Aerotrain has been tested for thousands of miles on a 4.2 mile track. The English and American entries are only in the model-testing stage. . Bell Aerosystems, P.O. Box 1, Buffalo, New York 14240
. Experimentation is being performed on automobiles to make them more efficient, more convenient, and at the same time not add to pollution problems. - The small electric car designed for short distances (30-50 miles) is convenient and does not add to air pollution.	. Some school physics departments have laboratory facilities for the building of models. If your school physics department has fuel cells or small rechargable batteries, arrange for some students to construct models. . If possible, borrow an electric golf cart and drive it around the school parking lot. Do the students believe that vehicles such as these or improved electric vehicles could serve a useful purpose in our communities?	. Electric cars have been available for many years. The first was built in 1837. Today most are in the form of golf carts, but in England it is estimated that 100,000 electric cars exist. . All car manufacturers are experimenting with electric vehicles.

ILLUSTRATION XXII

BASIC TYPES OF AIR CUSHION VEHICLES



PLENUM CHAMBER

The open plenum concept is basically an inverted chamber with a hole cut in the top. Air pumped through this hole into the chamber creates a pressure sufficient to lift the craft. Daylight clearance is approximately equal to the thickness of the air jet which flows out of the bottom perimeter of the craft.

ANNULAR JET

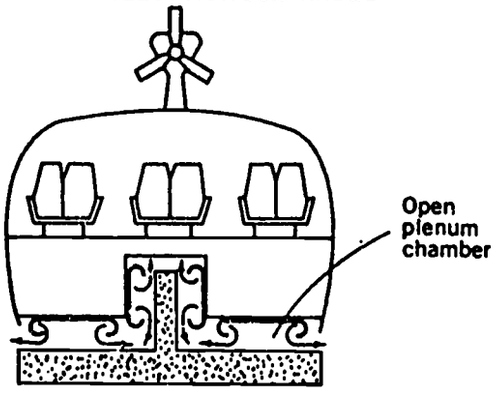
The annular jet, the most widely used means of developing an air cushion, attains a daylight clearance two to three times higher than the thickness of the escaping air. This is accomplished by fans forcing the air downward through slots around the periphery and slanting the air flow inward toward the center of the ACV. The angled air flow provides a seal that keeps about 60 percent of the air from leaking out---thus providing the cushion with reduced power.

FLEXIBLE TRUNKS

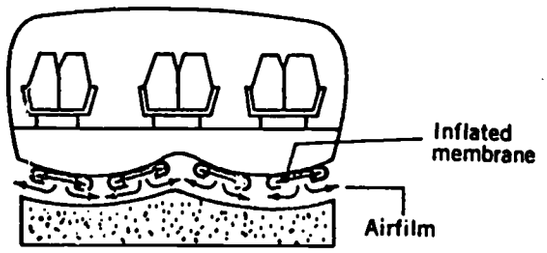
The addition of flexible trunks, or skirts, to an air cushion vehicle increases the obstacle or over-wave clearance by an amount almost equal to the skirt length, thus giving an ACV the performance capability of a much larger vehicle without skirts.

Courtesy of Bell Aerospace Division of Textron Inc.

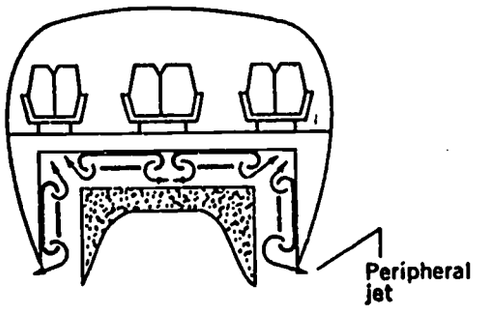
ILLUSTRATION XXIII



The French AERO TRAIN



General Motor's HOVAIR



England's HOVERTRAIN

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Rechargable batteries or electric fuel cells are considered the most logical sources of electric energy.		
	. What are the major problems with using batteries as the source of energy? In view of the necessity for frequent recharging and the relatively slow speed of a battery-operated automobile, do pupils foresee any major uses for this type of car in selected areas or situations?	. The fuel cell seems to hold some promise as a source of energy. The battery requires recharging while the fuel cell continues to convert directly into electricity as long as fuel is available.
- The individual jet belt and the personal helicopter seem ideas right out of the Buck Rogers comic strip, but they exist. - Bell Aerosystems has developed and tested the "Pogo" Jet Belt in one- and two-man models. - For a little more than $1,000, some do-it-yourself effort, and 300 feet of clear space for landing and taking off, you can own and operate a gyrocopter.	. Contact Bell Aerosystems and find out more about the "Pogo." . Ask students how they would like such a vehicle. Do they foresee a useful purpose for such a device except in military service? . Do students feel that a personal helicopter meets a real need in our transportation requirements? Why? . Contact the Bensen Aircraft Corporation to find out about the Bensen Gyrocopter.	. Bell Aerosystems, P.O. Box 1, Buffalo, New York 14240 . Bensen Aircraft Corporation, Raleigh, North Carolina 27600

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
. The need for multi-modal transportation may be partially realized by the use of vehicles that can use more than one right-of-way.	. Do students believe that improved usage of rights-of-way would create more efficient use of land? . Take a short movie film of the meridian strip (mall) of interstate highways. As the students look at this short film, do they consider this useful land or is it wasted? To what use might it be put?	. Hellman, Harold, *Transportation in the World of the Future*, M. Evans and Company, Inc., New York, p. 36
- One proposal is to make use of railroad rights-of-way. - A rail/bus is one that can travel on the highway and then move rapidly from one point to another on retractable steel wheels over existing railroad trackage.	. Do the students believe that the railroad tracks could be used more efficiently? How? Does the rail/bus system hold promise as a device to move people speedily and efficiently? . Contact The Port of New York Authority to find out what the tests on the rail/bus system revealed.	. The Port of New York Authority, 111 Eighth Avenue, New York, New York 10011
- The Ford Motor Company proposes a system called the airbus.	. Contact the Ford Motor Company and obtain information on the airbus. What possibilities exist for the airbus?	. Ford proposes a system of computer-dispatched buses to pick up air passengers at their homes or offices, transport them to the airport, and place the passenger unit into a large plane. At the end of the flight, the passenger unit of the bus would be unloaded and the process reversed.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
		. Ford Motor Company, Dearborn, Michigan 48120
- The North American Monorail Corporation proposes a monorail from Buffalo through Albany to New York, using the rights-of-way of the New York State Thruway or Barge Canal.	. Read the *Monorail Master Plan for New York State.* Some authorities do not regard the monorail plan favorably. What is the opinion of students?	. North American Monorail Corporation, 519 Columbia Street, Utica, New York 13502
- Car-carrying trains are being considered by Amtrak. Such trains are already in use between Washington, D.C., and Florida.	. Do the students believe that the car-carrying train system has some merit? Why? What advantages might this system offer? What are the disadvantages?	. Amtrak is exploring the idea of using a two-level railroad car into which passenger automobiles can be driven. *Coming A New Era For Train Buffs,* U.S. News and World Report, May 3, 1971, p. 29
	. Have students obtain information about the new Auto-Train Corporation service. Why has Auto-Train had some immediate success and why is it presently booked full when other railroad services lack patrons?	. *Auto-Train Makes Debut,* New York Times, December 8, 1971, p. 39 . *Auto Trip to Florida By Train,* U.S. News and World Report, April 3, 1972, p. 72 . *Luck, Pluck and a Hot Concept,* Forbes, April 1, 1972, p. 20 . *Transpo 72 - A Look Into the Future,* U.S. News and World Report, June 5, 1972

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- The supersonic transport and the hypersonic transport are current developments in the aviation industry.	. How do students think the SST or the hypersonic transport may change air travel in the future?	. The supersonic transport provides three times the speed and twice the capacity of the subsonic jets of today. The supersonic transport is a reality today. The hypersonic transport plane, with speeds of 4,000 to 5,000 m.p.h., flying in the upper atmosphere, is in the planning and development stage. The X-15 and X-15-2 have become realities and their successful rocket flights indicate what the possibilities are.
- The Space Scooter and the Space Shuttle Bus are closer to science fiction thinking than reality, but even they have possibilities for development.	. Have some of the students plan a skit based on travel in the year 2100. Encourage them to use their imagination, science fiction resources, and Flash Gordon comic strip ideas. The skit should deal with vacation plans for a family of four, father, mother, son, and daughter. Have students plan a trip anywhere in the world or universe. The earth science teacher might be of help as to what they will see in their cosmic travels.	. With new technology developed in our success in putting a man on the moon, new sources of power, new materials, and new scientific developments, science fiction is becoming a reality.

UNDERSTANDINGS	SUGGESTED PUPIL AND TEACHER ACTIVITIES	SOURCE
- Scientists are working on the problem of transporting the public at speeds of 18,000 to 25,000 m.p.h., velocities already achieved in space travel.	. What advantages or disadvantages do the students envision in traveling at such speeds? . Would they like to be able to travel at these speeds? Why? . Ask the school science teachers, school psychologist, and school physician what scientific, psychological, and physical problems might be involved in such speedy travel.	. With high orbital speeds, the problem is not how to keep the vehicle up, but how to keep it down. One suggestion is the use of tunnels or tubes through the earth, making no two cities on earth, more than three quarters of an hour apart in travel time.

TRANSPORTATION OF THE FUTURE
POSSIBLE SOLUTIONS TO OUR TRANSPORTATION PROBLEMS
SUMMARY

In this section,we have considered some of the possibilities which could change the picture of transportation in the coming years. It is evident that attitudes and philosophies must change if our society is to have improved transportation.

Many elements of the society believe that public transportation cannot survive without governmental aid. Others believe that the future of transportation lies only with the individual motorized vehicle. What is necessary is for an expanded program of planning, governmental cooperation, industrial willingness, and citizenship support to be developed. Only through cooperative efforts of this type on a national level, can all the variables involved in the field of transportation be taken into consideration and the most suitable solutions to the transportation crisis emerge.

The past 100 years have witnessed such dramatic events as underwater travel, networks of underground pipelines, the development of vast trucking systems, emergence of local and long distance bus lines as important common carriers, and the increasing use of aircraft for both freight and passenger hauling. Perhaps most significant of all developments, however, has been the phenomenal growth in ownership and use of the motor car. The automobile, a rarity and curiosity 75 years ago, is now so commonplace that we are moving from 1-car to 2-car and even 3-car family ownership. With such use of automobiles have come social, economic, environmental, and social changes which have affected even patterns of family life.

No doubt the transportation developments in the next 50-75 years will be just as dramatic as those of the past. Students might be challenged to envision what these changes will be and what their effect may be on American life. A glimpse at the hardware of the future was revealed at the recent exhibition, "Transpo 72," held at Dulles International Airport on May 26, 1972. Among the exhibits were these:

- cars that are computer-driven to a destination chosen by the passenger at the push of a button
- a 300-mile-an-hour electrically propelled train
- an inflatable airplane that can be carried in a 30- by 84-inch cylinder when deflated yet when inflated will carry two passengers at a speed of 70 miles an hour
- "people mover" elevators and traveling belts which will proceed to a destination chosen by the traveler at the touch of a button
- guideways to which a motorist will hook his car which will then be taken to a preselected destination
- tracked-air-cushion vehicles

While the crisis in transportation may seem at the moment insurmountable, the ingenuity of the American people, once dedicated to the task, should lead to success. As Woodrow Wilson said: "In the long run the people wobble right."

APPENDIX — METHOD OF SURVEY

Many teachers have used community surveys effectively and are familiar with the techniques of their development, use, and the tabulation of results. For the inexperienced teacher some suggestions follow:

1. Involve the class in developing the survey. The more class members share in proposing the aims of the survey, the questions to be asked, and the use to be made of the results, the more enthusiastic they will be about the project.

2. Let students make some mistakes. If a question is poorly worded or evokes an ambiguous answer, the students will soon find this out in a trial sample among their own peers.

3. The more concise and simple the survey, the greater the likelihood that the community will respond. Simple "check-off" or "yes-no" questions are easily answered, checked, and tabulated.

4. Try to obtain a cross section of the community response. Have each pupil survey five people such as family, friends, neighbors, etc.

5. Enlist the help of the media — newspapers, radio, and TV stations — to publicize the poll and the results.

6. Send copies of the results to local business, labor, and governmental agencies for their comments.

7. Upon completion of the survey, the students should work in committees, one committee dealing with one question, and compile the results. The tabulated results should be printed and used for class discussion.

8. A student-conducted survey is useful as a teaching tool only if the students are encouraged to make the survey real. The students should feel that their survey may have a part in the decision-making process of local officials.