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A FUTURE OUTLOOK IN TRANSPORTATION

Preface

If the present growth trends in highway traffic volumes, accidents, injuries and fatalities continue unchecked the situation will become unbearable.

The solutions proposed herein represent the views of the author and do not necessarily reflect official policy of the New Jersey Department of Transportation

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1. INTRODUCTION

As we travel around in our automobiles day after day, commuting back and forth to work, performing other daily trips, weekly trips and the occasional vacation trip, we get the feeling that traffic volumes are getting heavier day after day, week after week, month after month, and year after year. This impression is supported by fact. Also, we recognize the unchecked increasing trend in accidents, injuries and fatalities and we are satisfied that corrective measures should be taken, but what? There is nothing yet that has been done which reduces the overall increases in accidents, injuries and fatalities. In the following discussion we will illustrate the magnitude of these trends. We will project these trends into the future. We will illustrate possible results of these growing trends. We will offer possible alternate solutions, and we will stress an urgent need for a solution to the problems of highway traffic saturation and highway safety.

The outgoing generation may have a hopeless feeling for the future because they picture that the already bad conditions will grow to be much worse. The incoming generation shows no sign of fear because they have not been impressed by experiences of continued growth, and have full confidence that they will be able to solve any problem that faces them.

I represent the outgoing generation having been with the New Jersey Department of Transportation since 1927 (42 years). I have witnessed a wonderful period of growth and expansion. The next 42 years will witness a period filled with stimulating and exciting growth every bit as great as I witnessed and the incoming generations will solve the problem. How? I do not know.

It is apparent that our present growth trend in highway traffic volume will very shortly produce a point of super-saturation on our highways, roads and streets. Also, that the continued growth trend in highway accidents, injuries and fatalities will, by comparison, make our present day accident experience seem very insignificant. Our traffic volumes, our accidents, injuries and fatalities grow at a rate much faster than the increase in population.

2. POPULATION

New Jersey's population has been growing at a rate of 2.25 percent per year. This doubles every 30 years. Our population now is about 7-1/2 million. Population growth is not our problem but problems are created by this population. The problems of the future will be very complex and must be recognized now because it will take many years of planning before a solution can be found.

New Jersey's population has been growing at a rate faster than that of the United States,

which has been growing at a rate of 1.75 percent per year, equal to the growth rate for North America and also for the world. Africa and Asia grow at a rate of 2.0 percent per year, Oceania at a rate of 2.25 percent, and Latin America at a rate of 2.5 percent per year. Europe's growth has been at a rate of 1 percent per year. The growth rate for the United States is equal to doubling every 40 years. This means that 40 years from now, the United States population will be equal to the population of India at the present time, 400 million; and 80 years from now, the population of the United States will be equal to the present population of China, 800 million; and at that time, China's population will be more than the present population of the world, 3.2 billion people.

Eighty years is not a long period. There are only twenty-five 80-year periods in 2,000 years or, in other words, there are 80 generations of 25 years each in a 2,000 year period. With the population of the United States doubling every 40 years, there will be 1,000 years from now, one person for every 2 square inches of land area in the United States, including Alaska; and 2,000 years from now, there will be 15 million people per square inch of land area, including Alaska. In my estimation, this is enough to justify space exploration. Earth may be the only place in the universe where life of any kind exists. Yes, there may be radical changes between now and 1,000 or 2,000 years from now but there are no radical changes in view to solve our problems for the next 50 or so years.

New Jersey is the most densely populated state in the country and has the most densely populated municipality in the country. Hudson County and Essex County are the two most densely populated counties in the state. It is logical to expect that transportation problems will occur here sooner than anywhere else. In the year 2025, your grandchildren will be the same age as you are now and my grandchildren will be the same age as I am now. At that time, there will be 27 million people in New Jersey. This amounts to an average of 5.6 people per acre. In 1960, Hudson and Essex Counties had an average of 14.8 people per acre, so on this basis the state will not be overcrowded. I do not expect that birth control will alter our population growth. Birth control is not new. It was practiced many years ago. I do not believe that the current decrease in the birth rate will affect the overall long range population growth. We have had declining birth rates before followed by increasing birth rates.

3. MOTOR VEHICLE TRAFFIC

The total vehicle miles traveled on our highways, roads and streets, rises twice as fast as population. Overcrowding will occur here long before population causes overcrowding.

In 1966, the average person traveled 5,000 miles. In the year 2025, this will amount to 20,000 miles per person per year.

Hudson and Essex Counties together carry 5 billion vehicle miles compared to the State's total of 40 billion vehicle miles as of 1970. Those familiar with the area are conscious of the fact that this is very close to the saturation point, if not already there. The normal growth of traffic for the State is doubling every 15 years. Therefore, by the year 2015, Hudson and Essex Counties should be carrying 40 billion vehicle miles per year. This is equal to the total vehicle miles carried in the State this year. In order to do this, the road system would have to carry much more than their known capacity but the law of impenetrability prohibits this. To carry 40 billion vehicle miles, consider the following: A 20 percent increase in the miles of state highways and each state highway 16 lanes wide, each county highway 8 lanes wide, and each city street to carry 3-1/2 times as much traffic as it carries now. This does not seem possible.

Since the time of the first automobile there has been only a 23 percent increase in road mileage in the nation. In New Jersey, the state highway mileage increased 17 percent from 1935 to 1966 and some of this was the adoption of other existing roads into the state highway system.

Each state highway would have to carry 320,000 cars per AADT compared to today's maximum on Route 1 at Newark Airport of 120,000 on 8 lanes and the George Washington Bridge with 184,000 on 14 lanes. Manhattan carried 2 billion vehicle miles in 1963 on 507 miles of roads and streets or 11,500 per AADT and statements have been made that additional traffic should be discouraged.

The potential for motor vehicle travel in the Hudson-Essex County area for the year 2015 is 40 billion vehicle miles. Assuming that the capacity is 20 billion vehicle miles, there remains an additional 20 billion vehicle miles to be satisfied by other means or lost to other areas. This 20 billion vehicle miles to be satisfied by mass transportation is equivalent to 34 billion passenger miles. In the year of 1963, there were 2 billion passenger miles carried on the subways of Manhattan and 1/2 billion passenger miles on buses. The railroads in New Jersey carry /.1 billion passenger miles. Even if a mass transit system with a capacity of 34 billion passenger miles per year were provided, it is doubtful that it would attract this much use. Instead, people would move to other areas less congested which will still be available in the country. Increases in population and related activities would occur elsewhere to take the overflow from Hudson and Essex Counties.

There seems to be much room for expansion in the rest of New Jersey. So, to examine this, we can investigate the saturation point for Cape May and Sussex Counties which are the least densely populated counties. The indication is that these countie will reach saturation by the year 2040, or 70 years from now. By that time, the entire State would be well over saturation.

4. SAFETY

In addition to the not too pleasant outlook of overcrowding is the very unpleasant future for highway accidents, injuries and fatalities. The number of motor vehicle accidents increases at 6 percent per year which is equal to doubling every 12 years.

At the present time there are over 200,000 accidents per year in New Jersey. At a continued increase of 6 percent per year, there would be in the year 2025 more than 5 million accidents, or more than 25 times as many as are occurring now. The number of injuries increase at a rate of 9 percent per year, or they double every 8 years. At the present time, there are close to 150,000 injuries per year but with a continuation of the current trend, there would be in the year 2025 more than 20 million injuries. This is about 130 times as many as we have now.

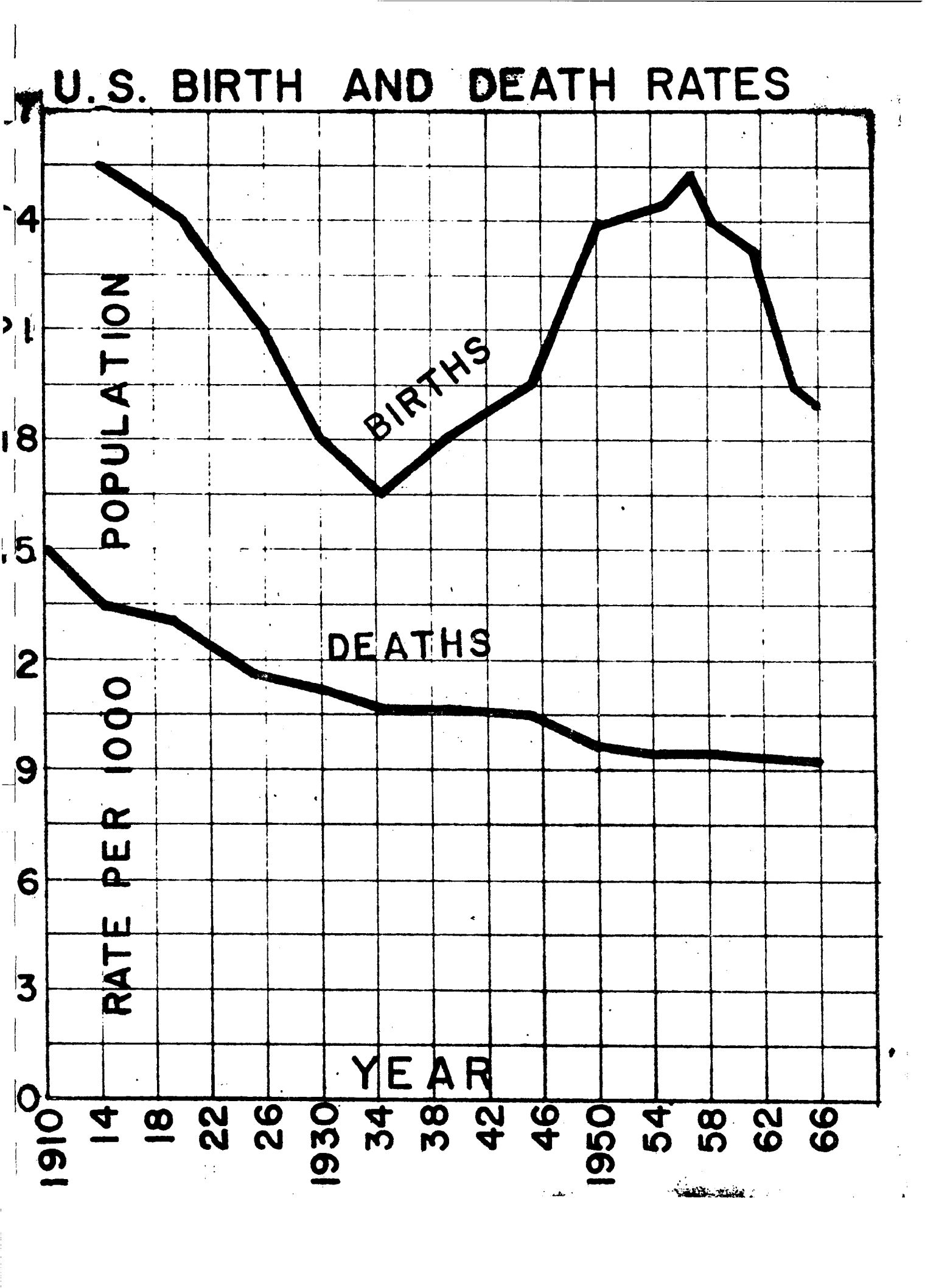
During 1968, there were 1,322 fatalities and increasing at a rate of 7.25 percent per year or doubling every 10 years, will result in around 100,000 fatalities in the one year of 2025. This is about 80 times as many as we have now and is equal to almost twice as many as happen in the entire country.

The accident, injury and fatality rates are also increasing very fast.

5. SOLUTIONS

What can be the solution? I do not know. Staggering of working hours and other activities around the 24-hour clock will help. This would mean that there would be just as much activity at 4:00 a.m. as at 5:00 p.m. Staggered weekends would help. That is, some people observing Friday and Saturday, and others Sunday and Monday.

Another aid is mass transportation. An article in the New York Times 50 years ago was encouraging the construction of highways in order to relieve the railroads of the increasing transportation needs. Today, the reverse is true. Many types of transportation have been mentioned to carry large masses of people and goods. Most of them sound ridiculous today but it is very possible that one or more than one may later on prove to be a normal way of travel. One recommendation is to put all modes of travel by mass transportation and motor vehicle underground leaving the ground level for pedestrians. With our current growth of highway traffic, there will be 75 years from now as much motor vehicle travel in New Jersey as there is at the present time in the entire United States. It may again be that we will have to live close enough to our place of employment so that we can walk back and forth to work. Moving sidewalks which have been demonstrated may be extensively utilized. I have always felt that any problem that we wish to solve could be solved and I am sure that the problems that I mentioned for the future will be solved by the incoming generations.


U.S. BIRTH AND DEATH RATES
POPULATION
BIRTHS
DEATHS
RATE PER 1000
YEAR
0
3
6
9
12
15
18
21
24
1910
14
18
22
26
1930
34
38
42
46
1950
54
58
62
66

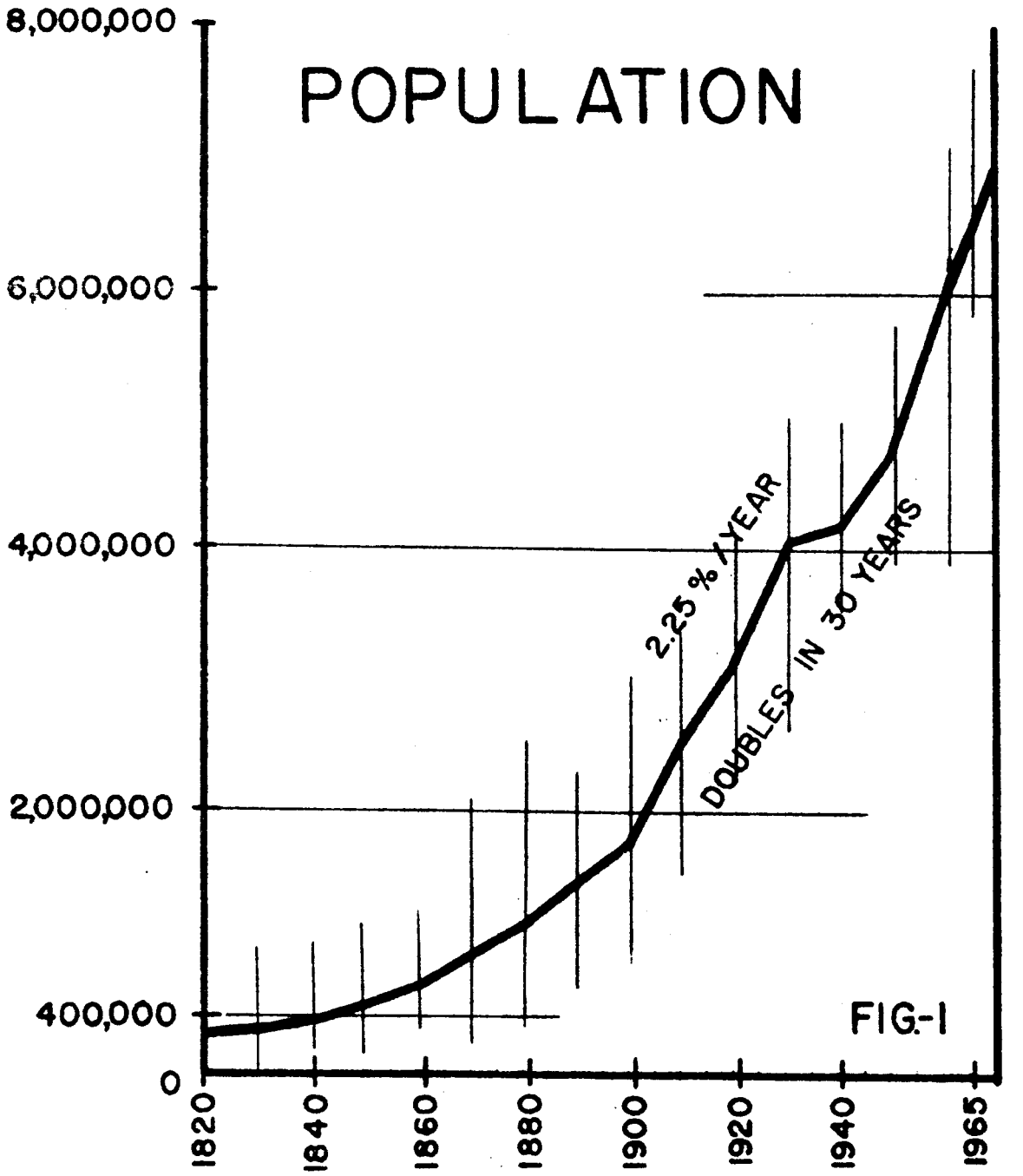
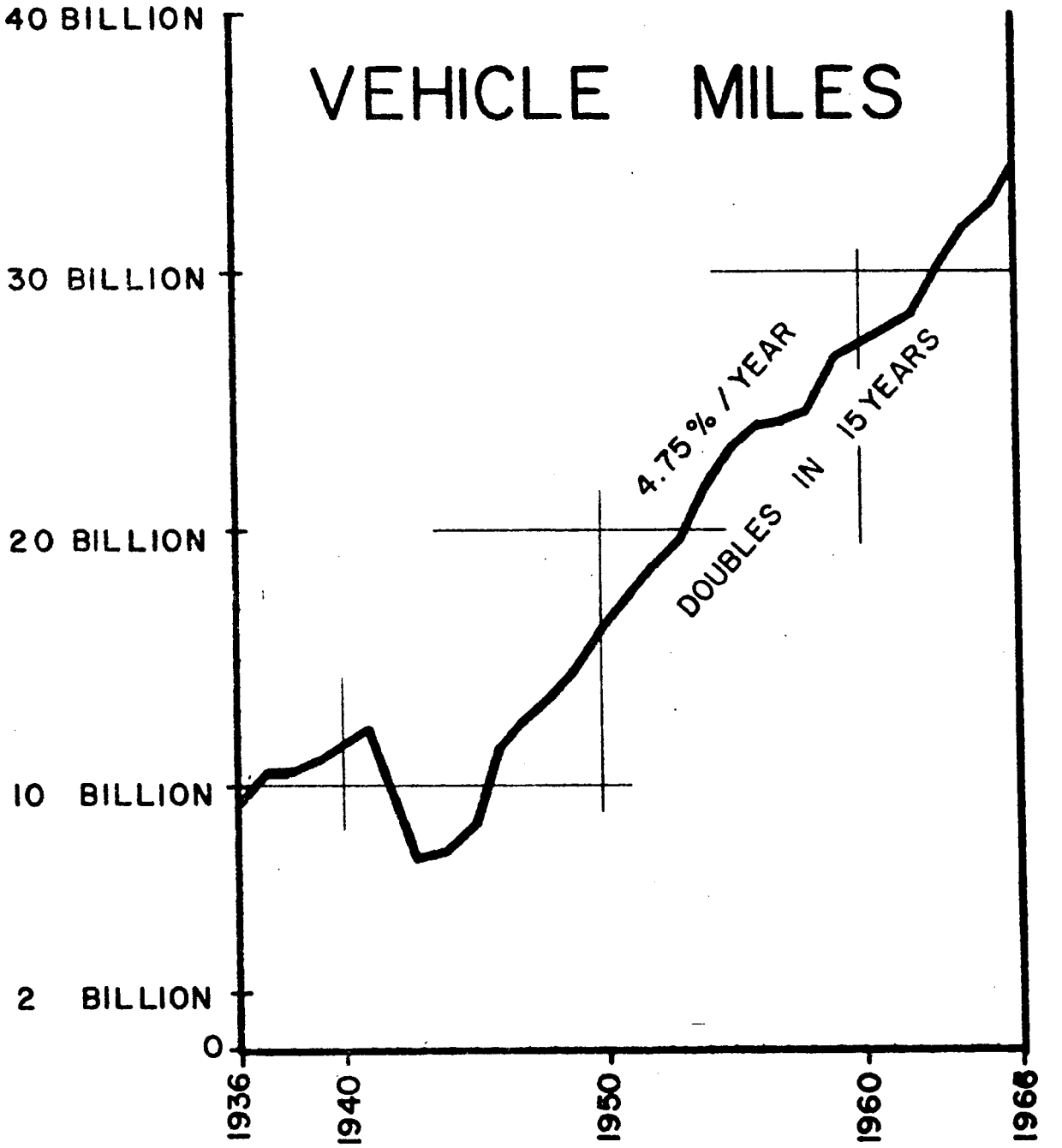
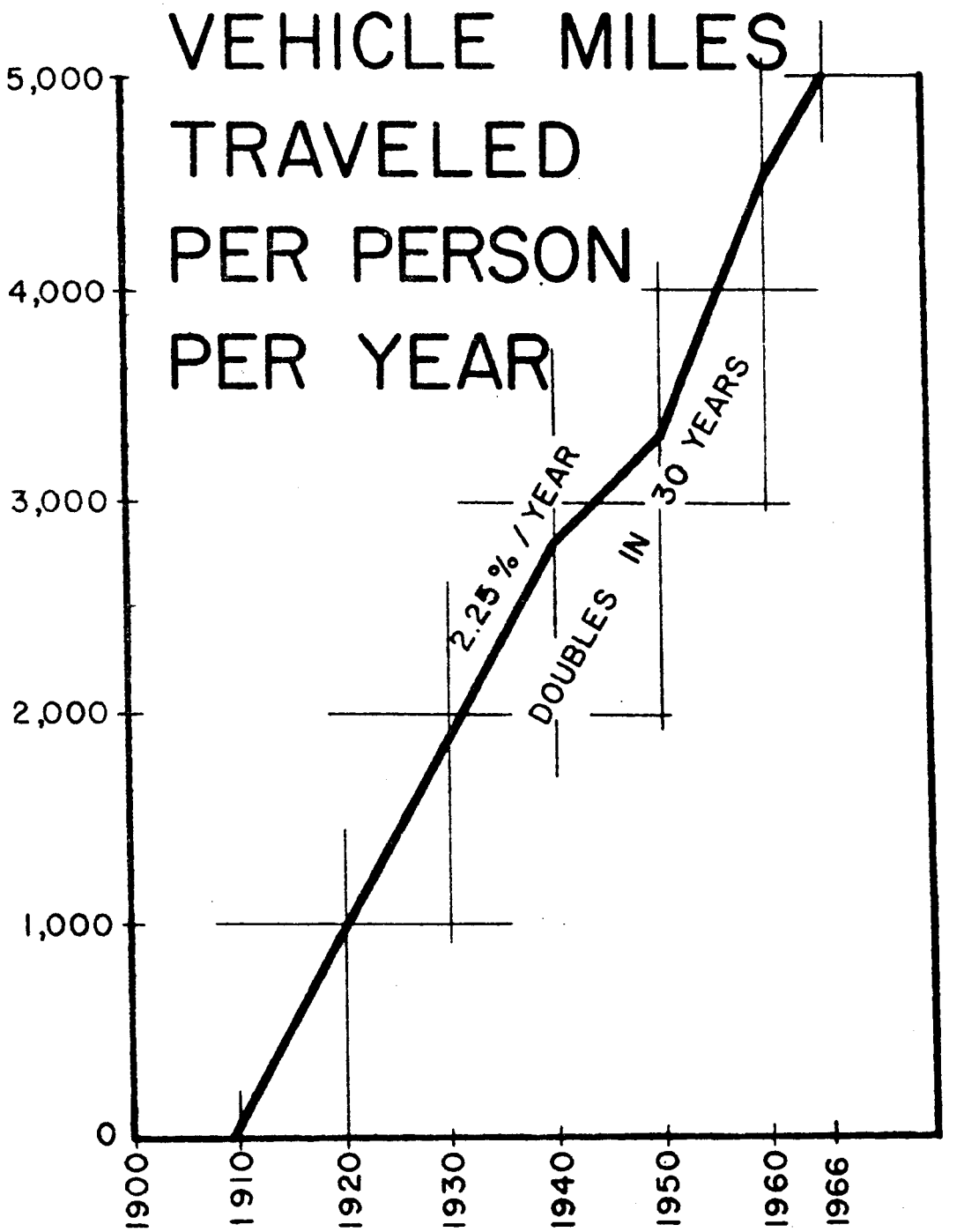
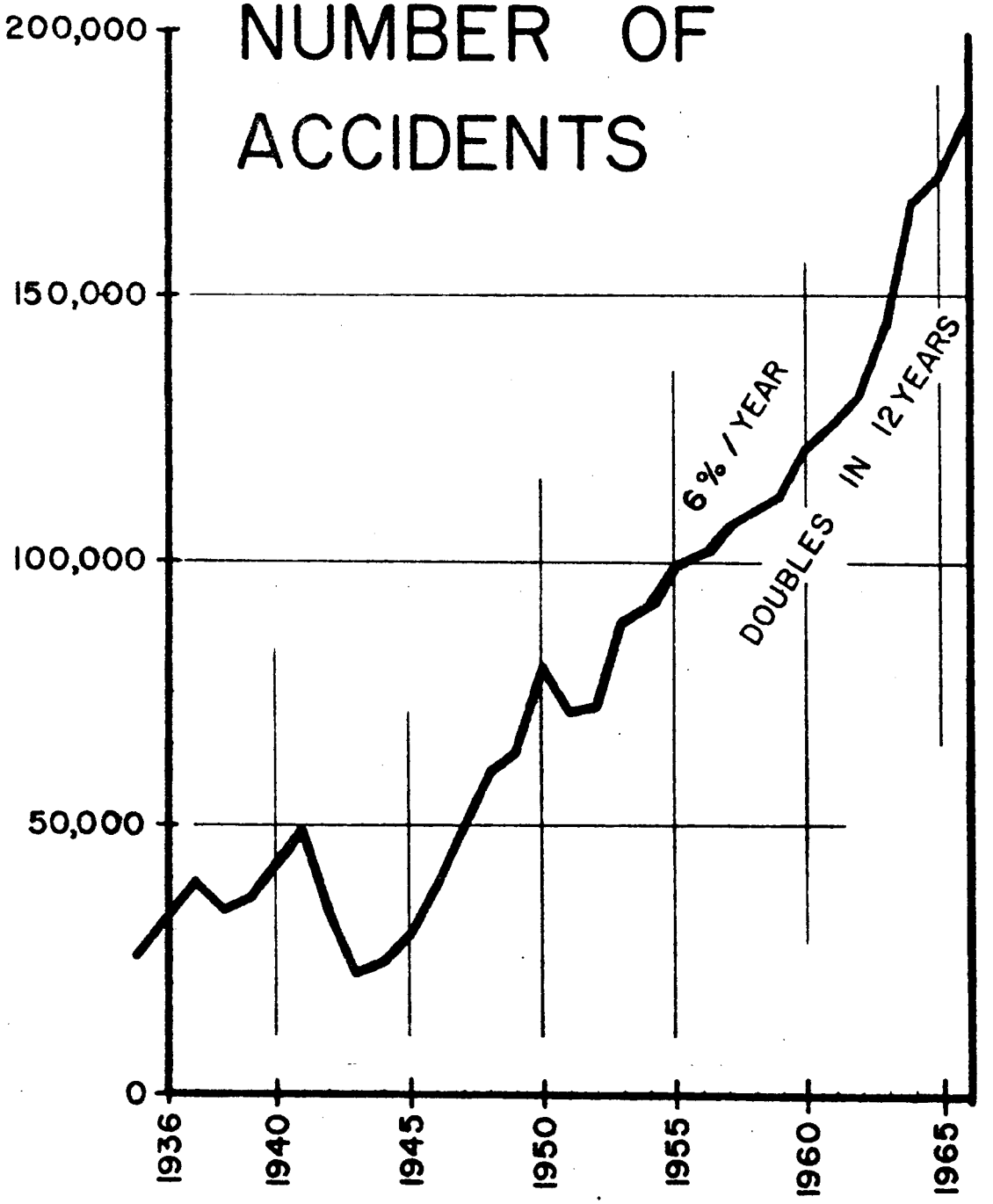
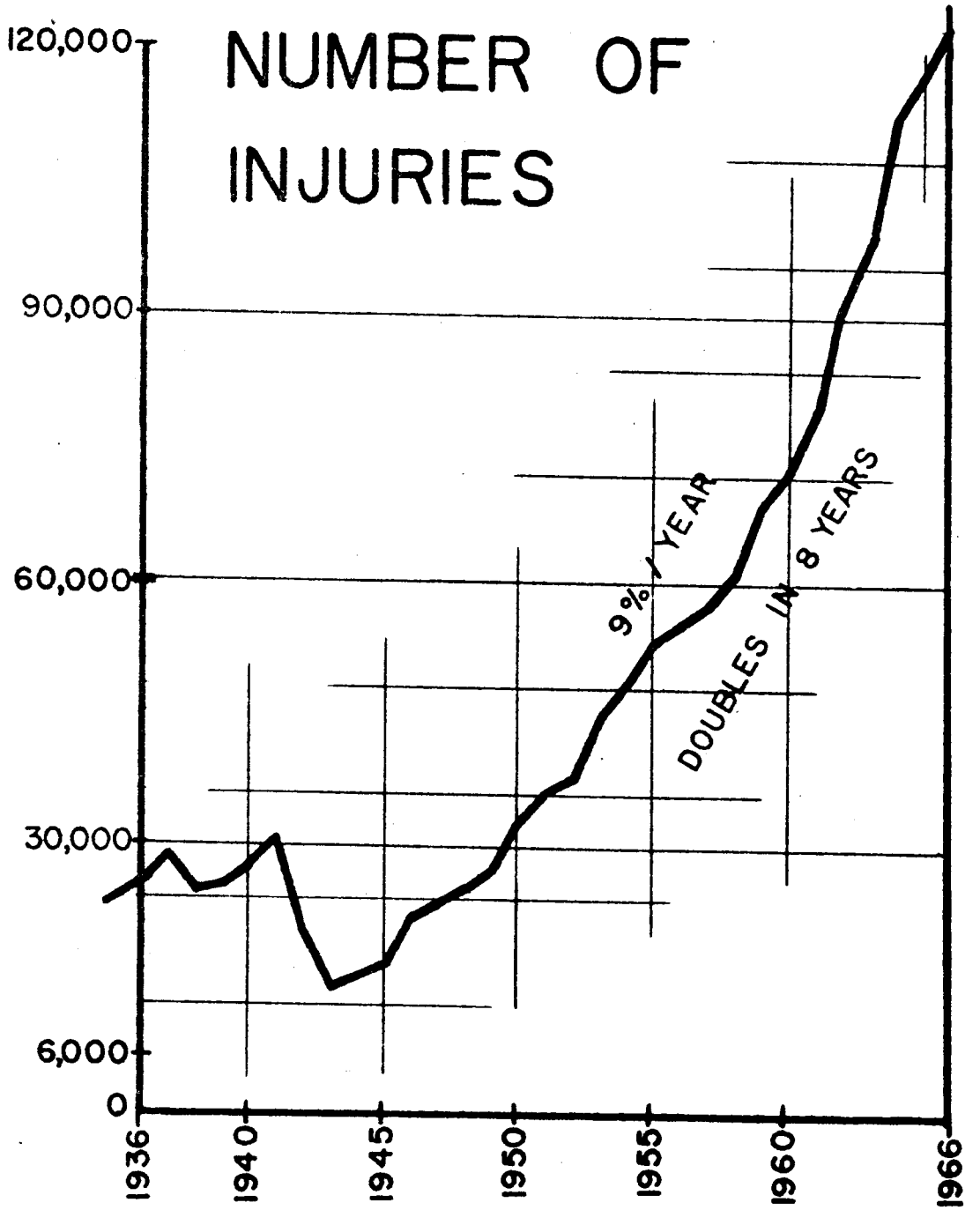

POPULATION
8,000,000
6,000,000
4,000,000
2,000,000
400,000
0
1820
1840
1860
1880
1900
1920
1940
1965
2.25 % / YEAR
DOUBLES IN 30 YEARS

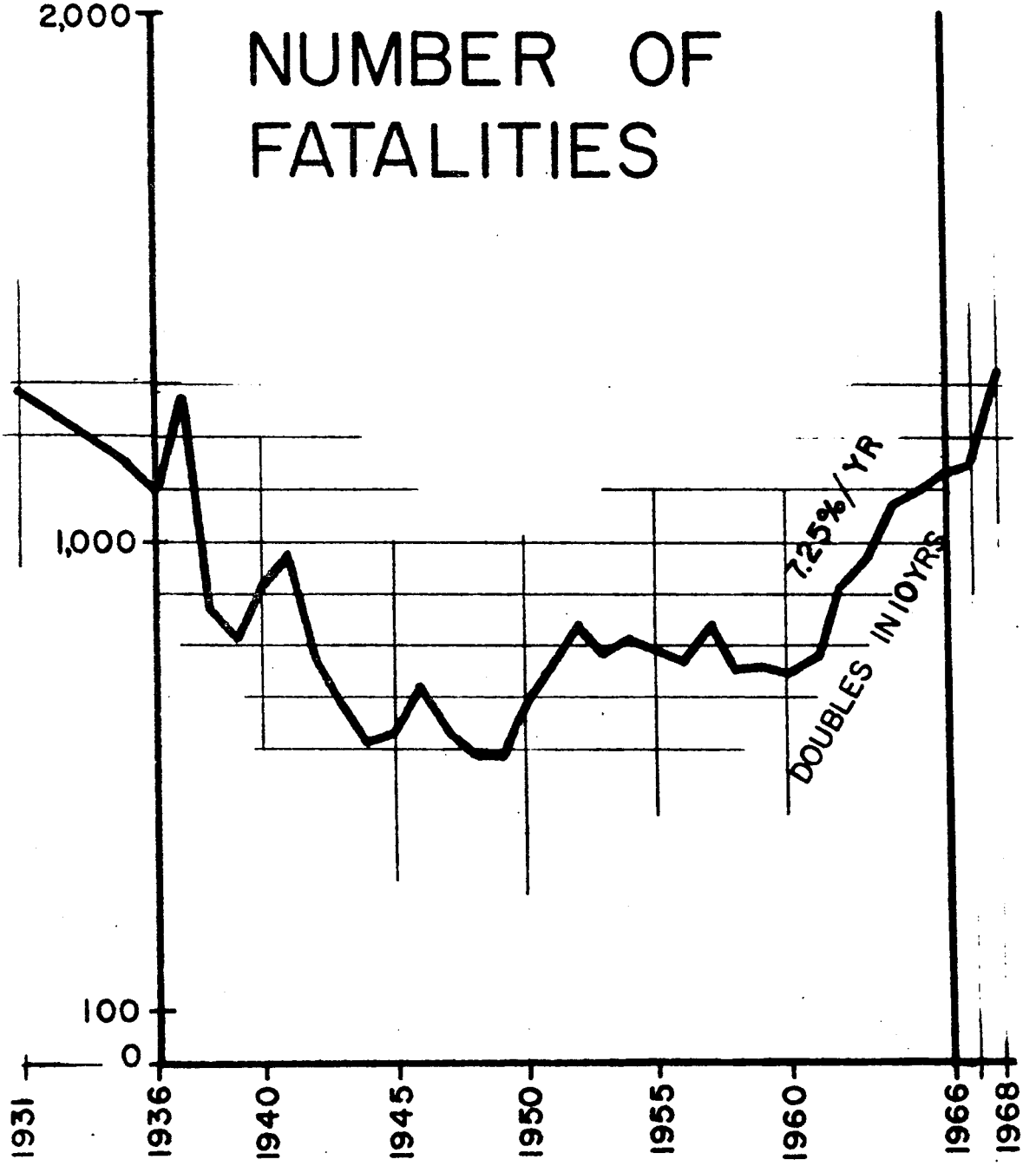
FIG-1

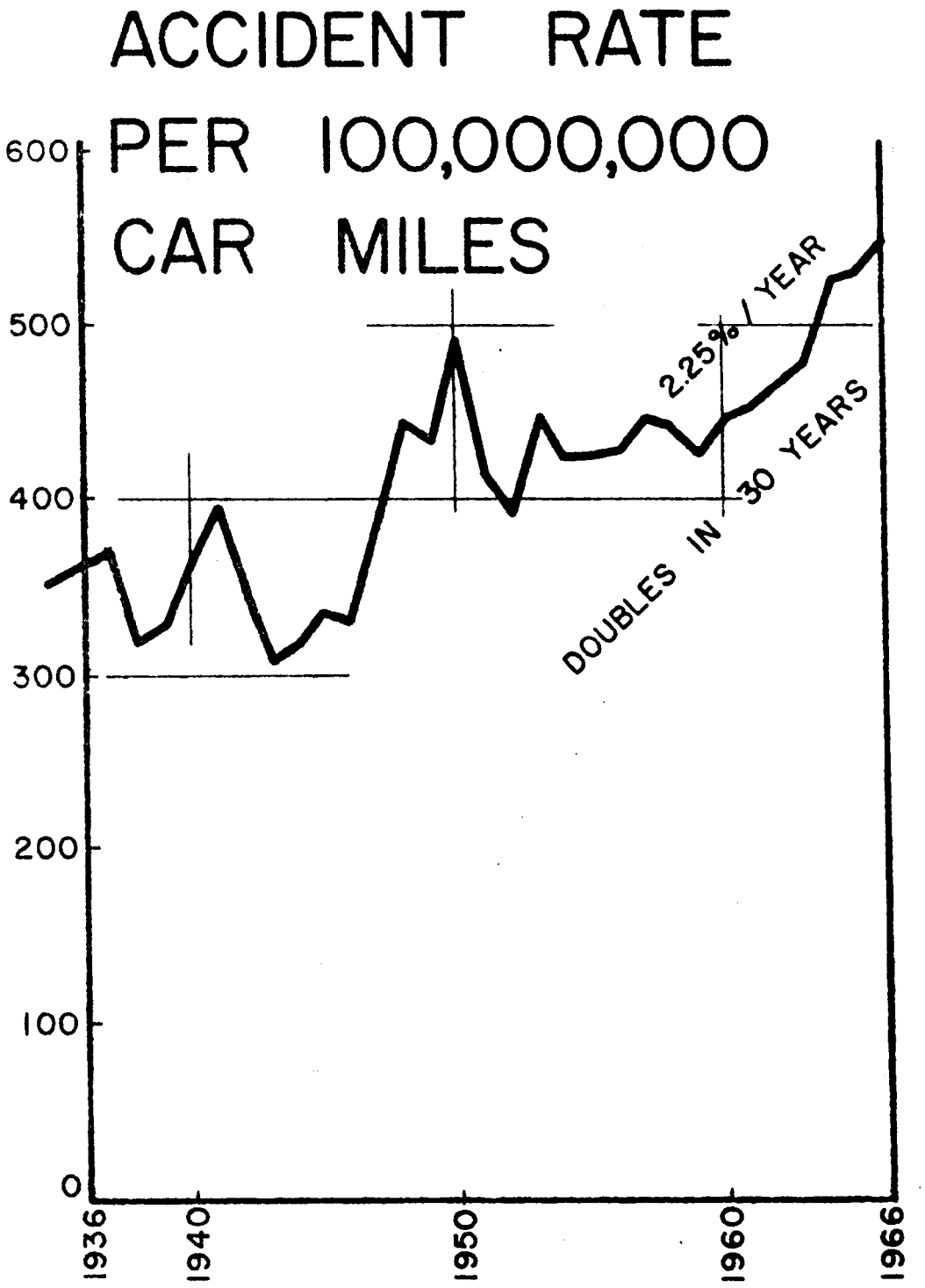

VEHICLE MILES
40 BILLION
30 BILLION
20 BILLION
10 BILLION
2 BILLION
0
1936
1940
1950
1960
1965
4.75% / YEAR
DOUBLES IN 15 YEARS

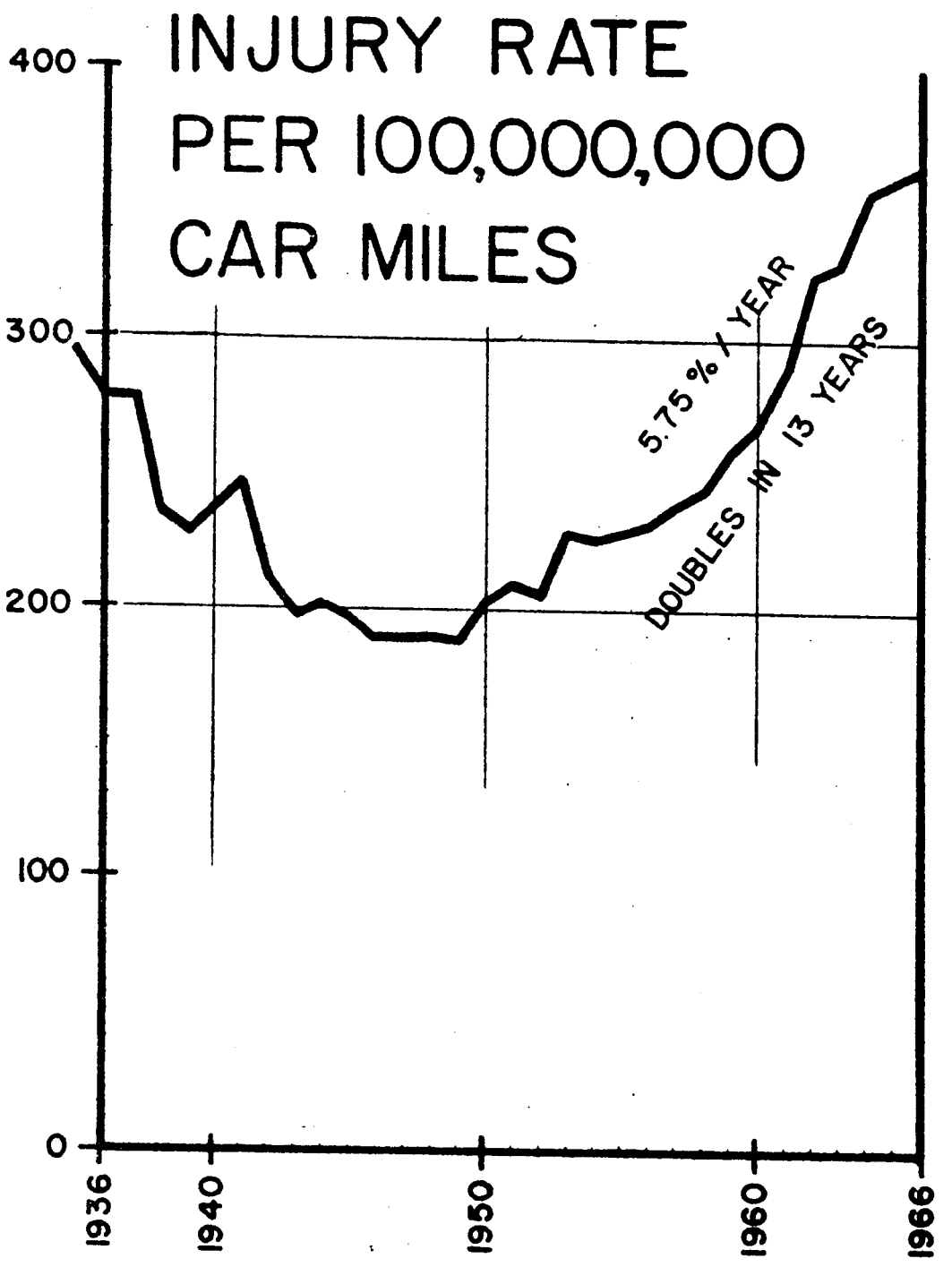

VEHICLE MILES TRAVELED PER PERSON PER YEAR
5,000
4,000
3,000
2,000
1,000
0
1900
1910
1920
1930
1940
1950
1960
1966
2.25% / YEAR
DOUBLES IN 30 YEARS

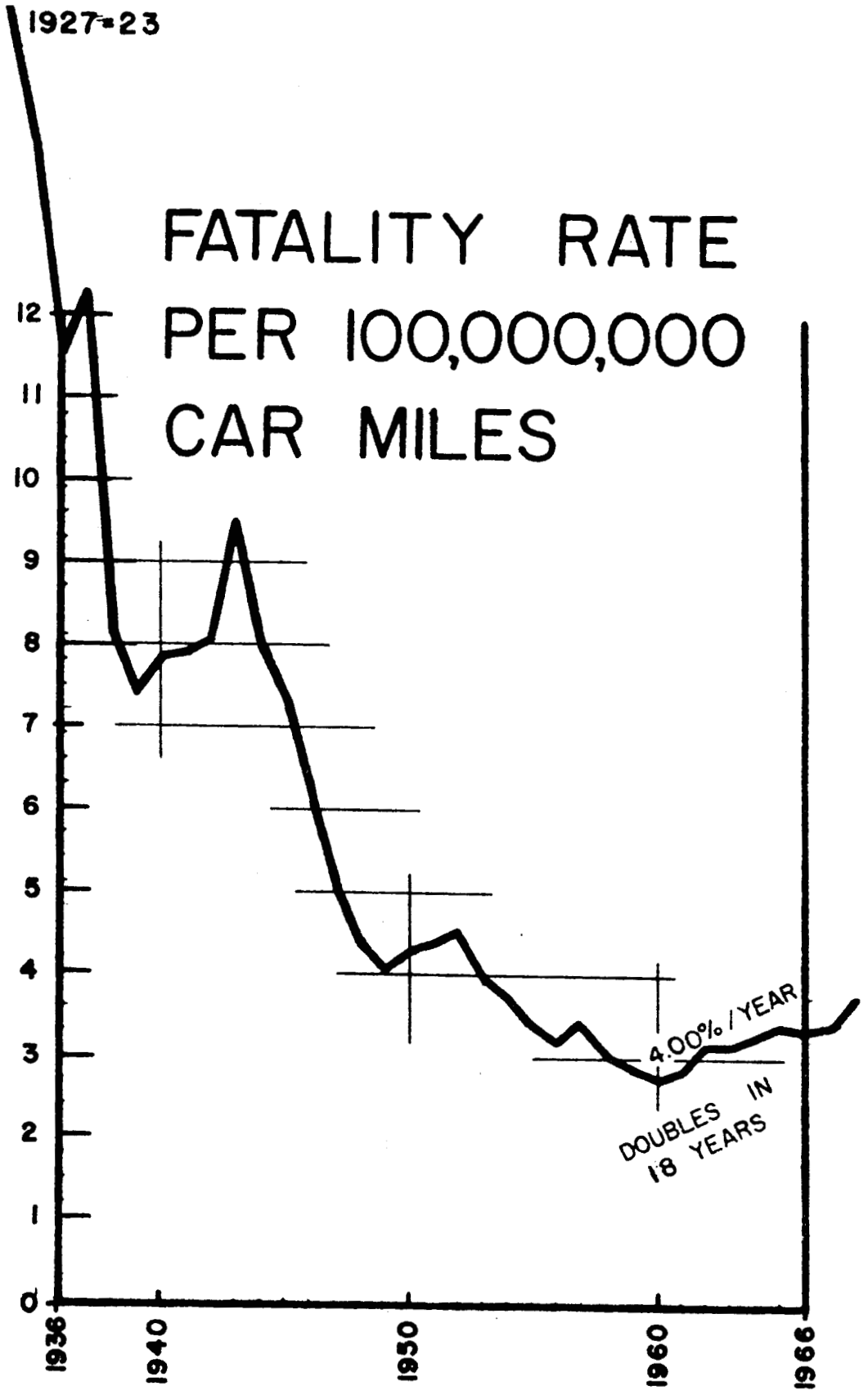

NUMBER OF ACCIDENTS
200,000
150,000
100,000
50,000
0
1936
1940
1945
1950
1955
1960
1965
6% / YEAR
DOUBLES IN 12 YEARS


NUMBER OF INJURIES
120,000
90,000
60,000
30,000
6,000
0
1936
1940
1945
1950
1955
1960
1966
9% / YEAR
DOUBLES IN 8 YEARS


NUMBER OF FATALITIES
2,000
1,000
100
0
1931
1936
1940
1945
1950
1955
1960
1966
1968
7.25%/YR
DOUBLES IN 10 YRS


ACCIDENT RATE
PER 100,000,000
CAR MILES
600
500
400
300
200
100
0
1936
1940
1950
1960
1966
2.25% / YEAR
DOUBLES IN 30 YEARS


INJURY RATE
PER 100,000,000
CAR MILES
400
300
200
100
0
1936
1940
1950
1960
1966
5.75% / YEAR
DOUBLES IN 13 YEARS


1927=23
FATALITY RATE
PER 100,000,000
CAR MILES
12
11
10
9
8
7
6
5
4
3
2
1
0
1936
1940
1950
1960
1966
4.00% / YEAR
DOUBLES IN
18 YEARS