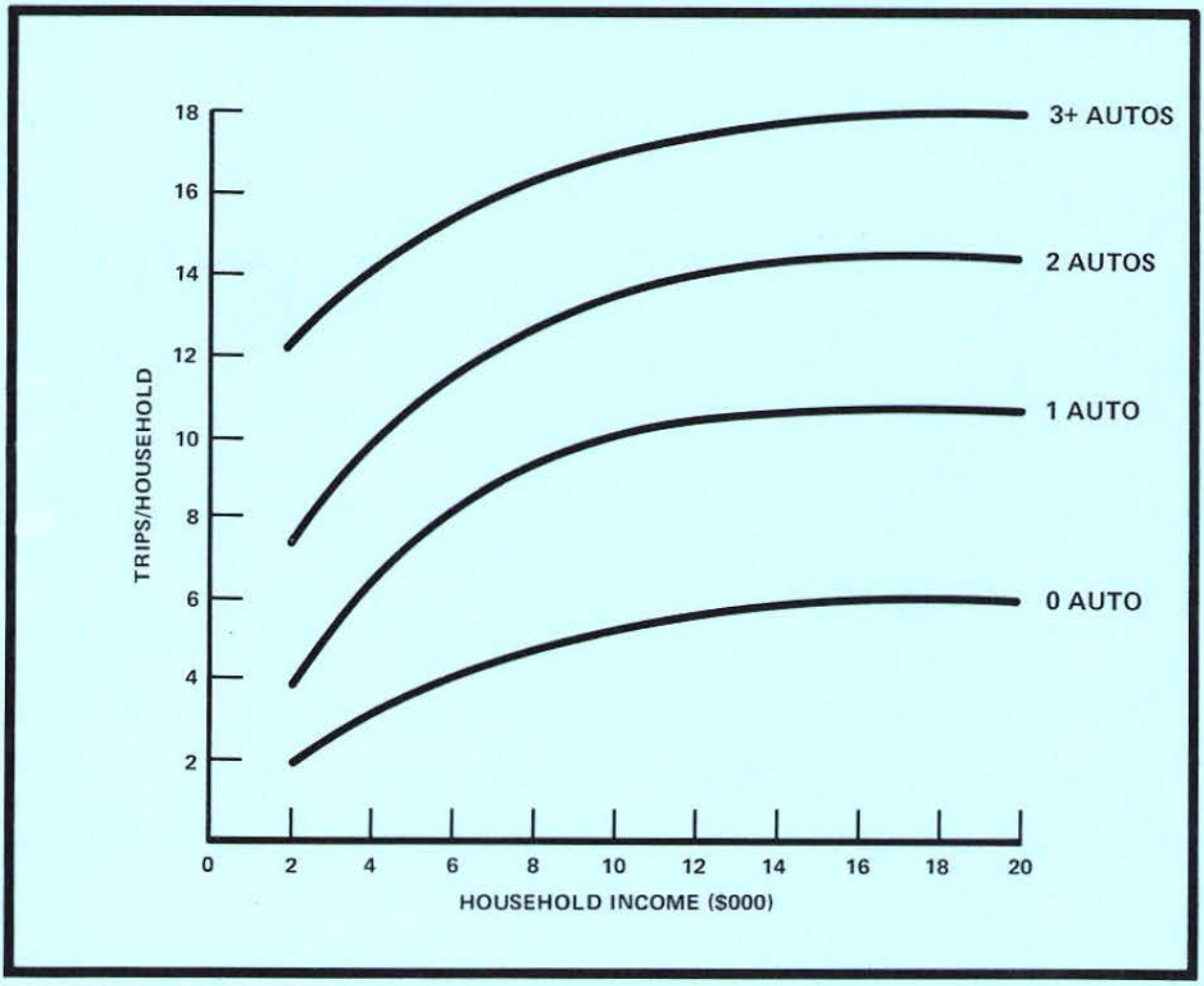
TRIP GENERATION ANALYSIS

APPENDIX E

August 1975



U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration
Urban Planning Division

PREFACE

Many areas are contemplating the "borrowing" of travel relationships to synthesize travel rather than engaging in costly and time-consuming origin-destination travel surveys. To assist these areas in using the synthetic approach, this document provides composite household person trip production curves derived from travel information in several urbanized areas.

This document has been developed as Appendix E to the manual, "Trip Generation Analysis." In order to provide timely distribution, Appendix E will be distributed as a separate document; however, when it becomes necessary to update the trip generation manual, Appendix E will be incorporated in the manual. Also, as new trip rate information becomes available, it will be included in this appendix.

APPENDIX E

COMPOSITE HOUSEHOLD TRIP PRODUCTION RELATIONSHIPS

INTRODUCTION

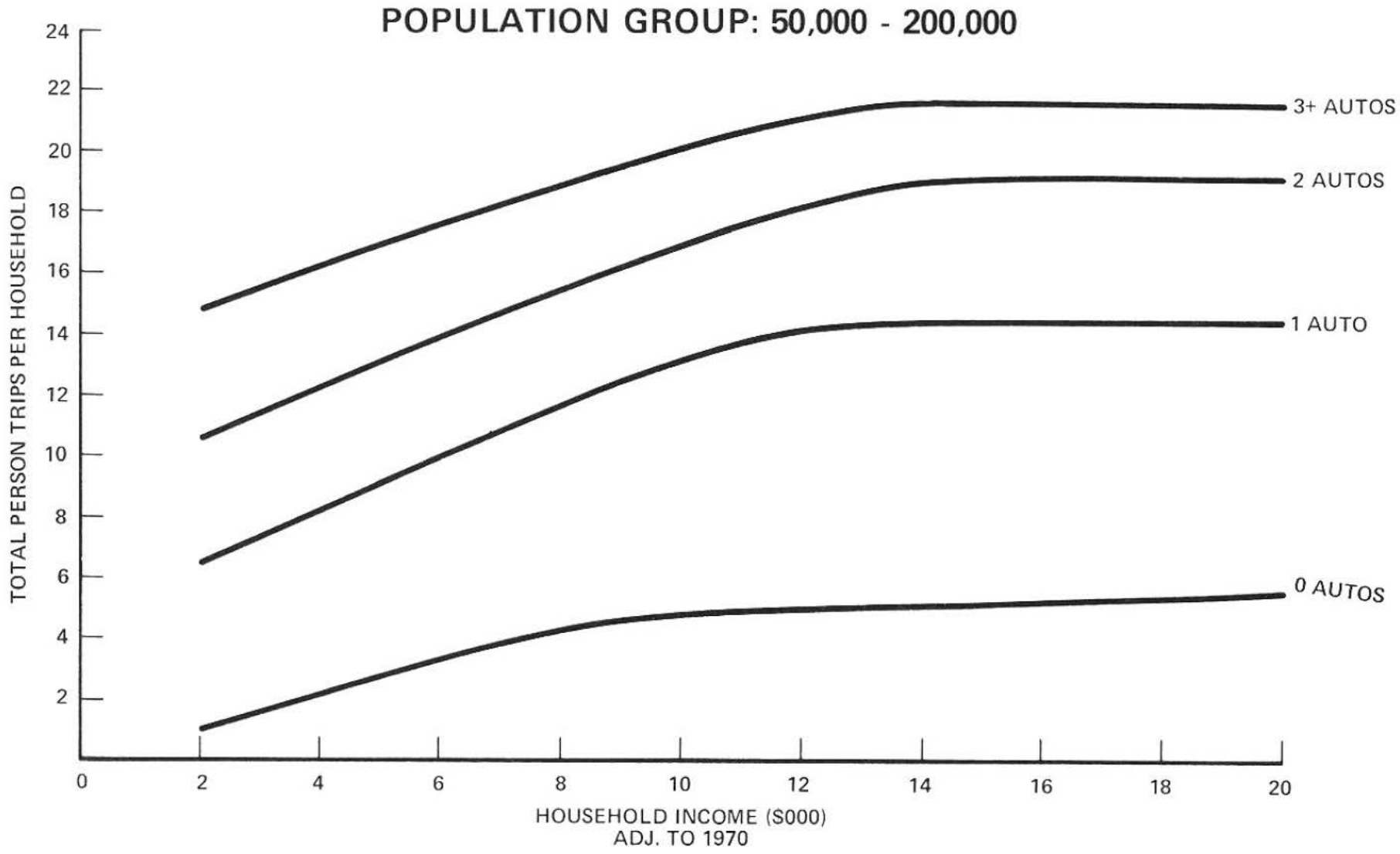
As resources for supporting the urban transportation planning process are becoming more limited, many urbanized areas are synthesizing internal travel by "borrowing" travel relationships from other study areas. To provide some assistance in selecting appropriate trip production rates in the synthesis procedure, this appendix has been prepared. It illustrates household trip production curves that have been developed by summarizing the person trip production rates in Appendix B and trip rates from various other urbanized areas. In addition to providing trip production rates for use in these synthesis procedure, the relationships may be used as a check in assessing the reasonableness of locally developed relationships.

The appendix is divided into three parts: (1) composite household trip production curves for three population groups--50,000-200,000; 200,000-750,000; and greater than 750,000; (2) composite household trip production curves for three automobile ownership categories--0-auto households, 1-auto households, 2-auto households, and 3+-auto households; and (3) household trip production curves for the individual urbanized areas used in developing the composite curves.

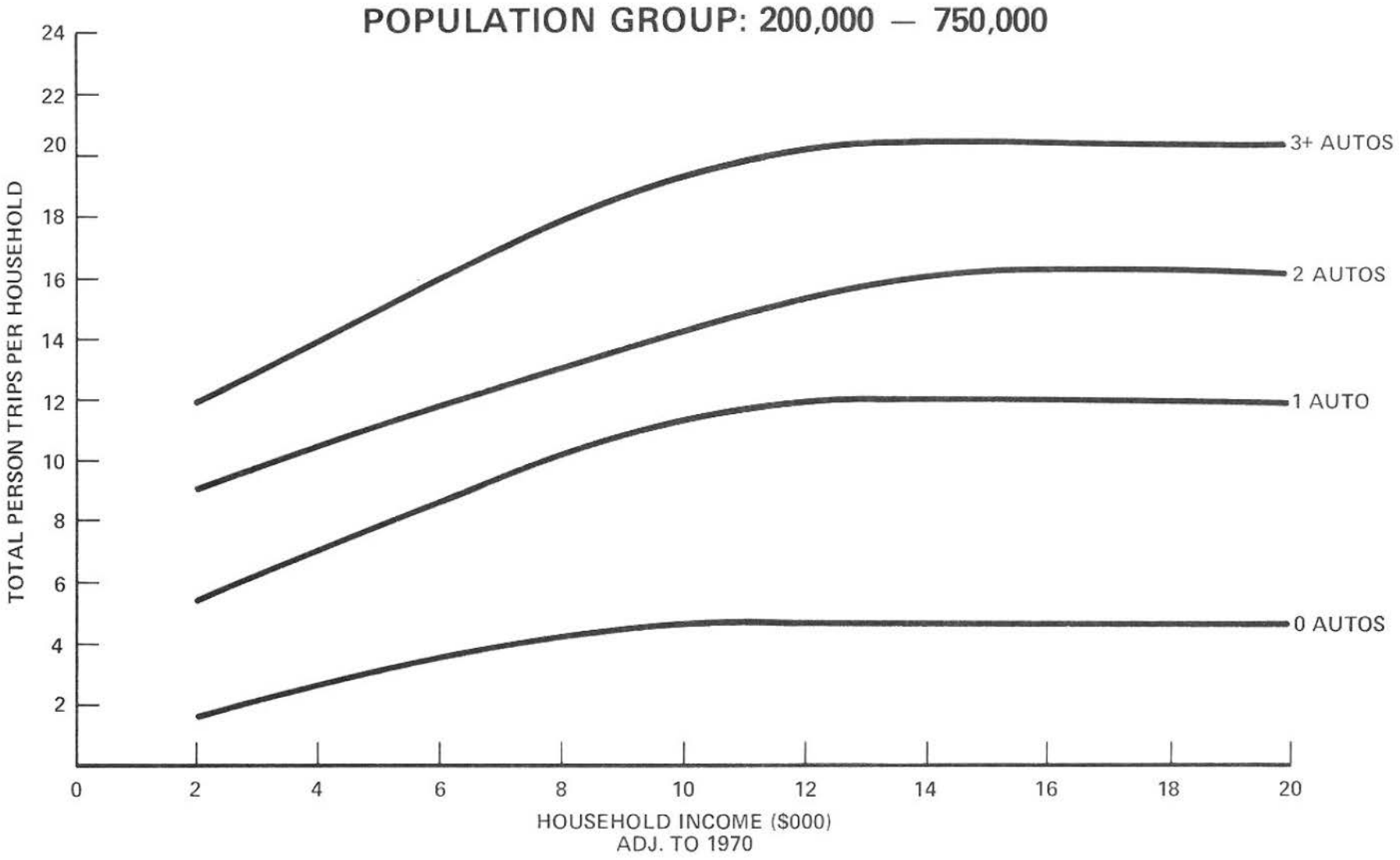
In developing the composite curves for each of the three population groups, all points representing the person trip rates for each income and automobile ownership stratification were plotted. After the trip rates for all the urbanized areas in each population group were plotted, curves were drawn through the average of these points. The curves were smoothed in order to maintain logical relationships between trips and automobile ownership and income. Similarily, the curves for the individual urbanized areas were smoothed.

Because the income data in Appendix B is expressed in terms of ranges (i.e., $10,000-12,000), the midpoint of the range was used for plotting purposes. In addition, the midpoint household income was adjusted to 1970 constant dollars using the consumer price index. This adjustment was made to assure a common base in developing the curves.

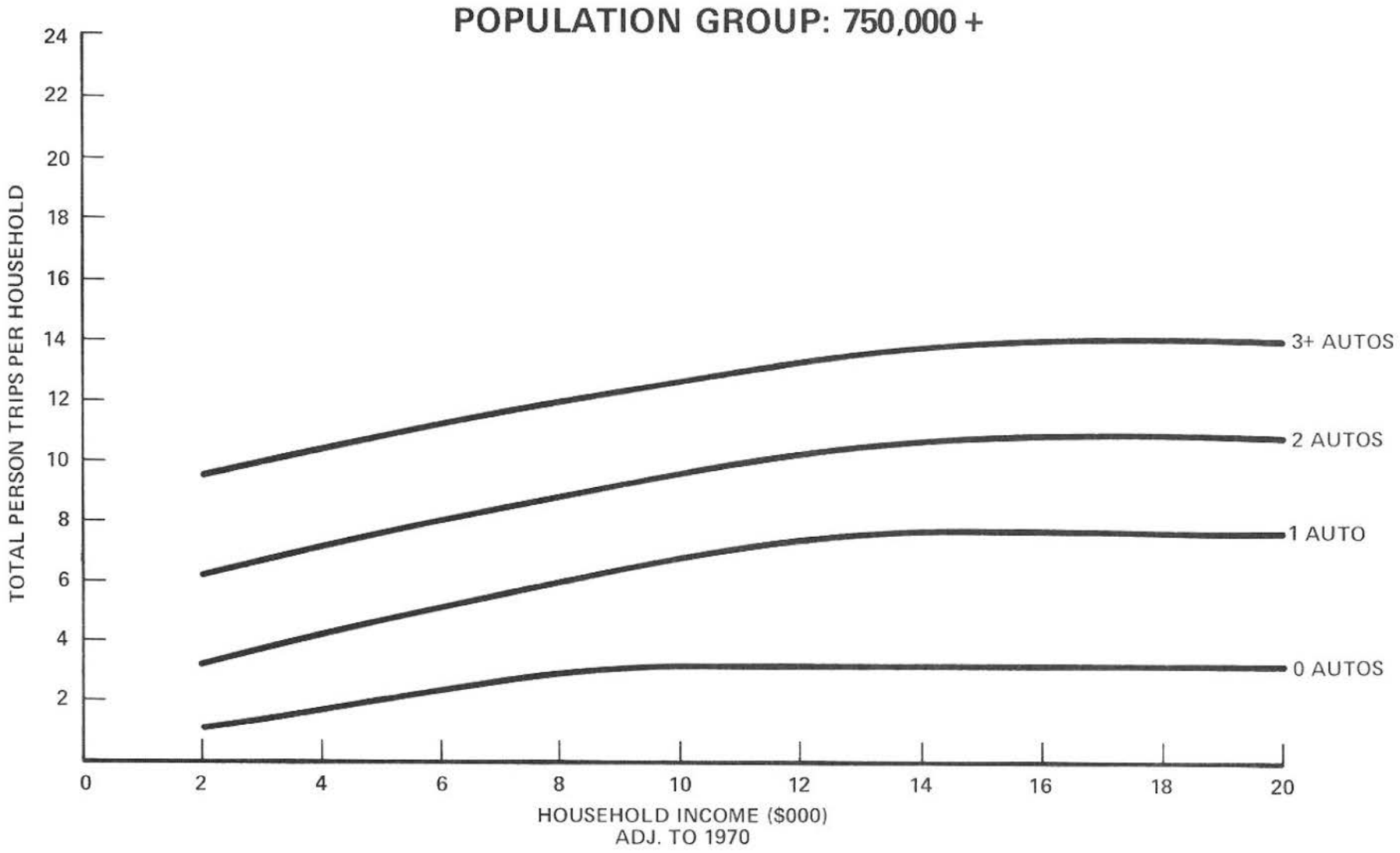
COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES



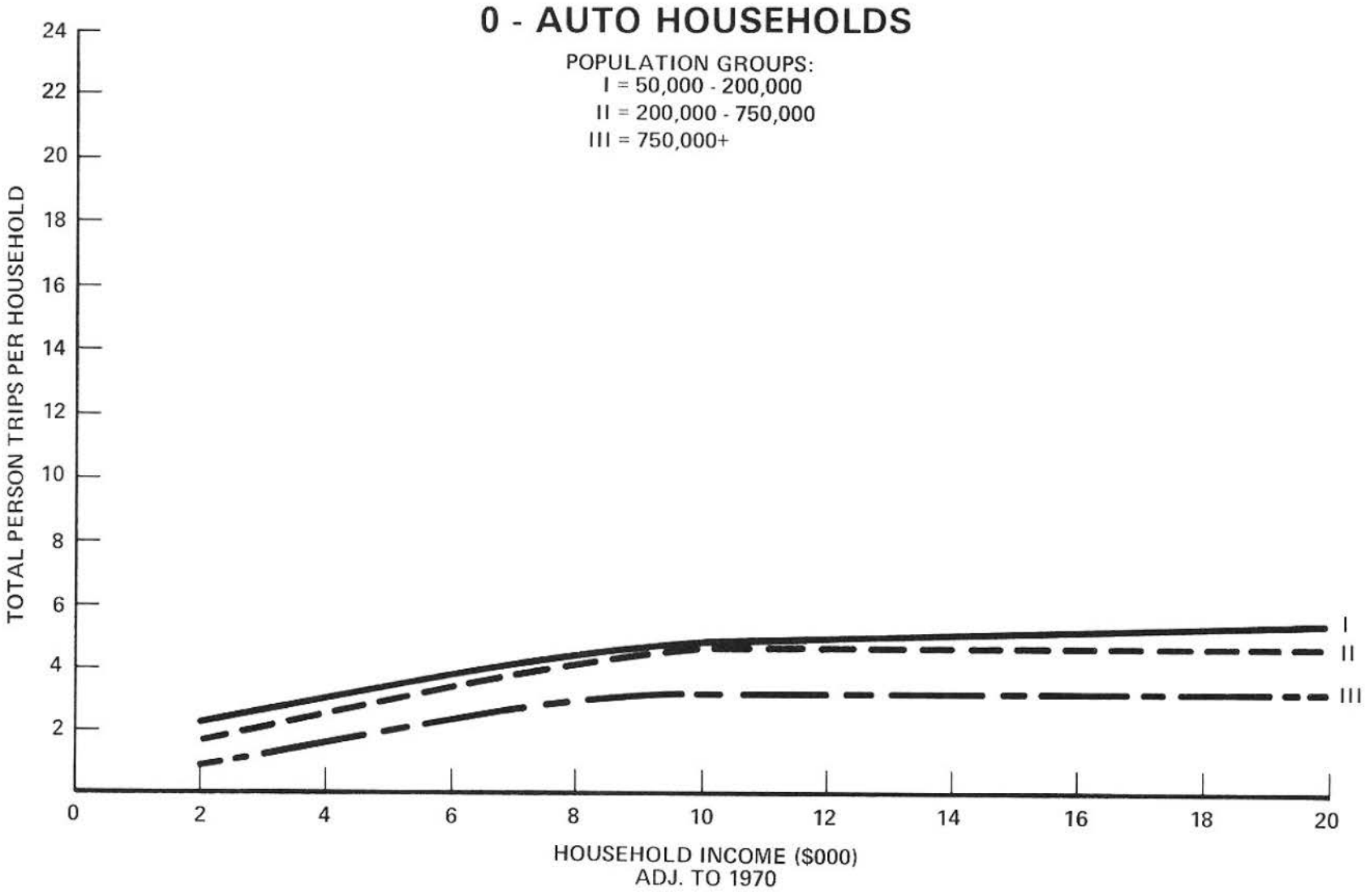
COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES



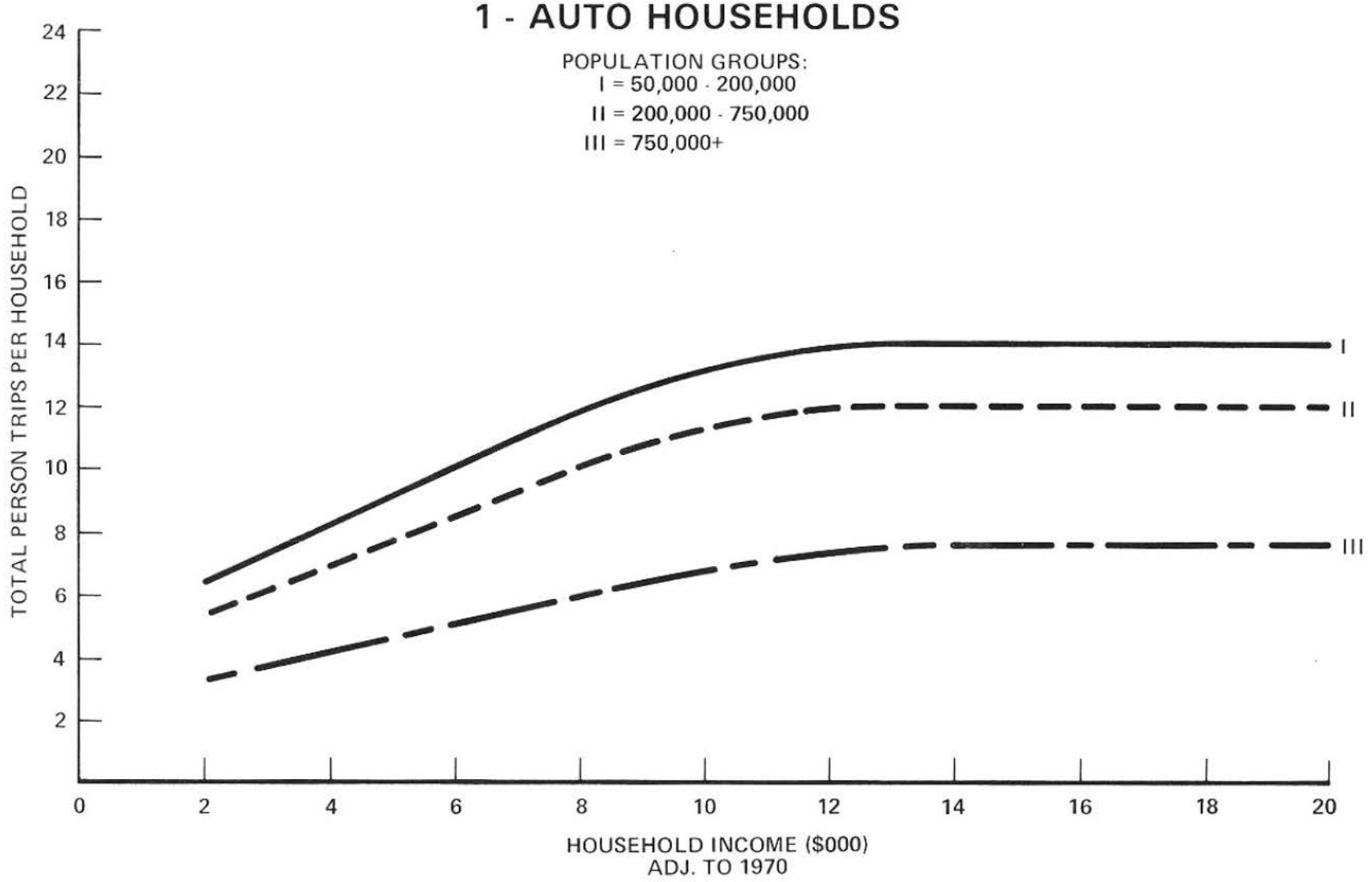
COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES



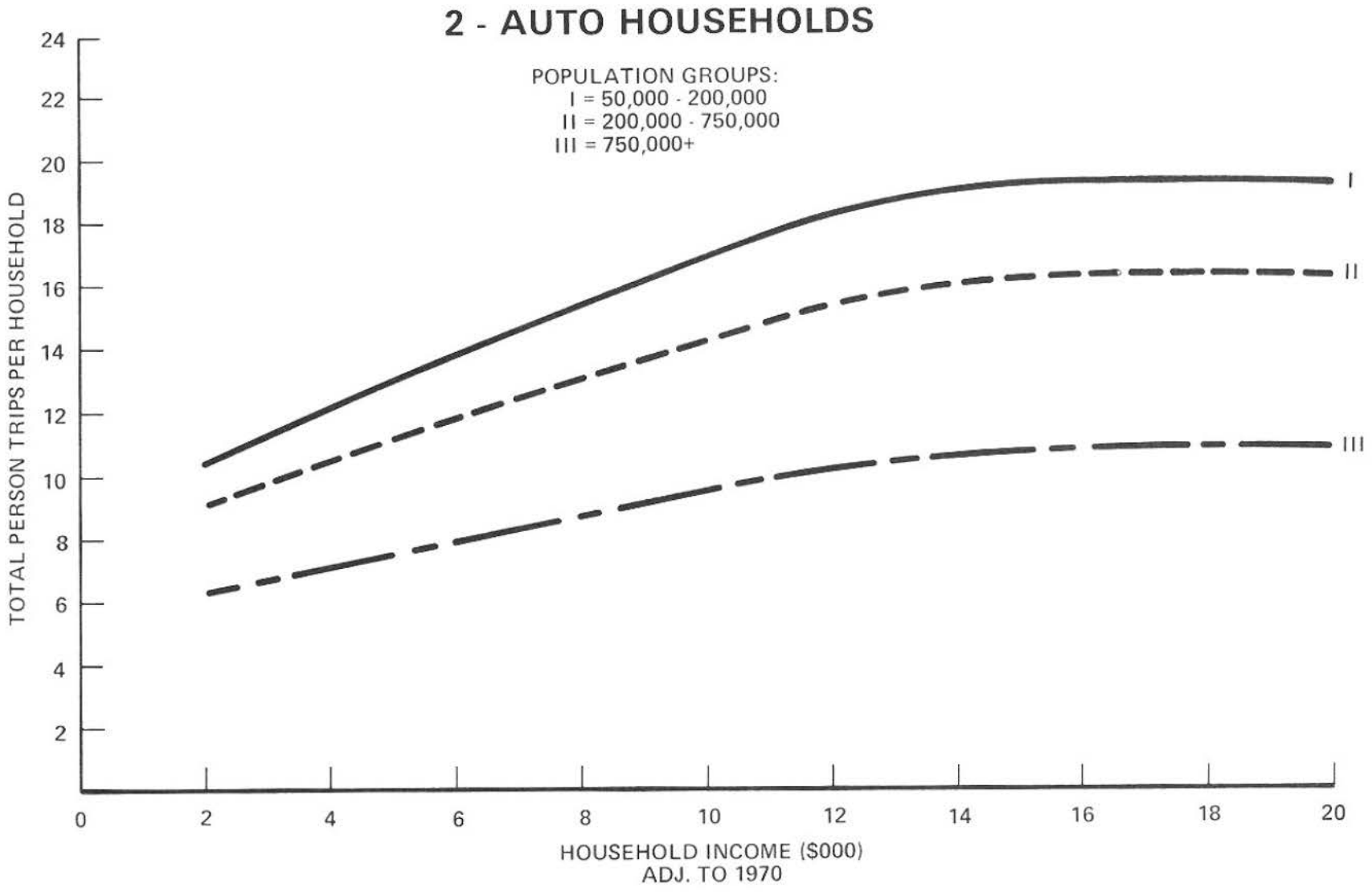
COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES



COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES

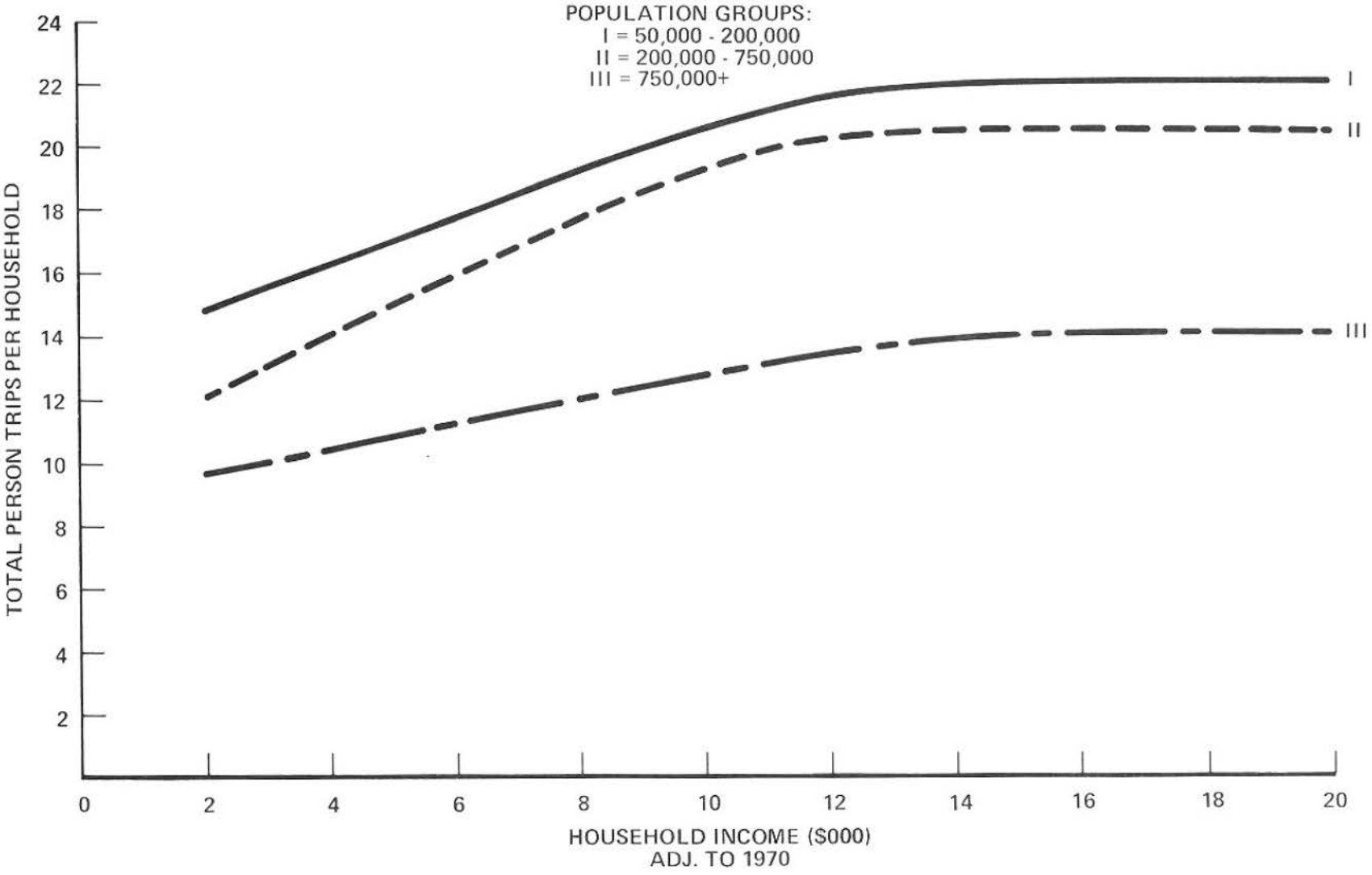


COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES



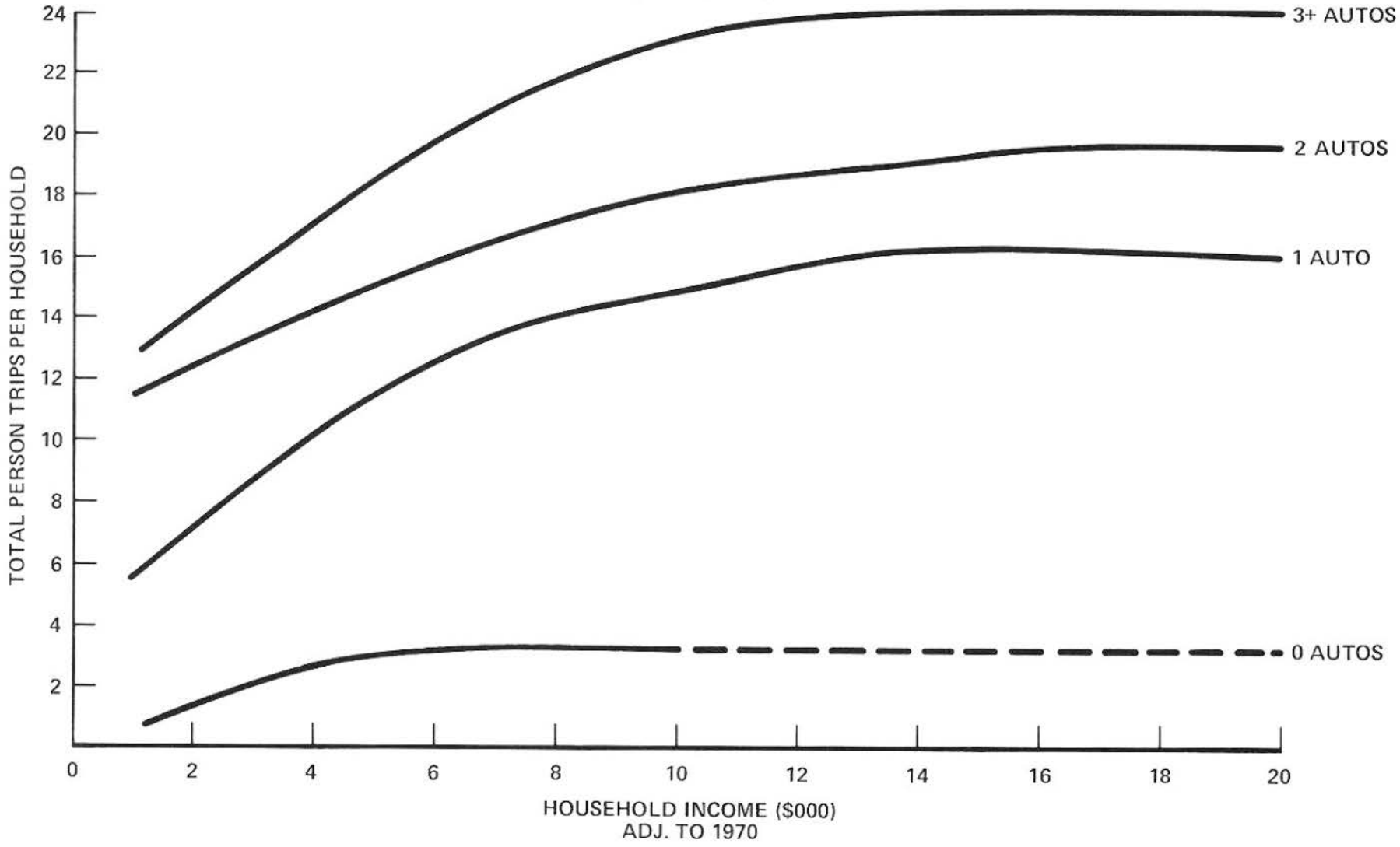
COMPOSITE HOUSEHOLD PERSON TRIP PRODUCTION CURVES

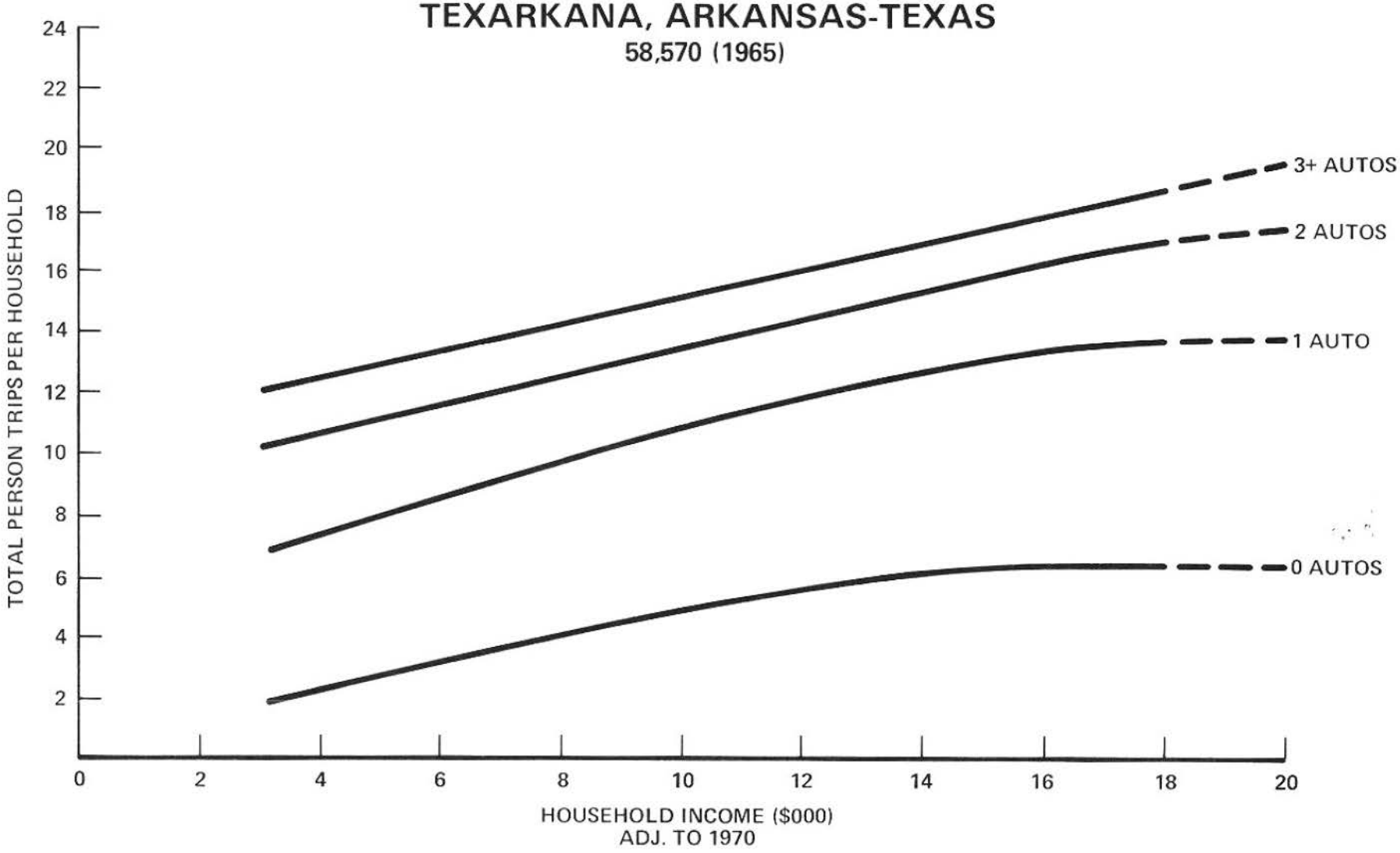
3^+ - AUTO HOUSEHOLDS



HOLLAND, MICHIGAN

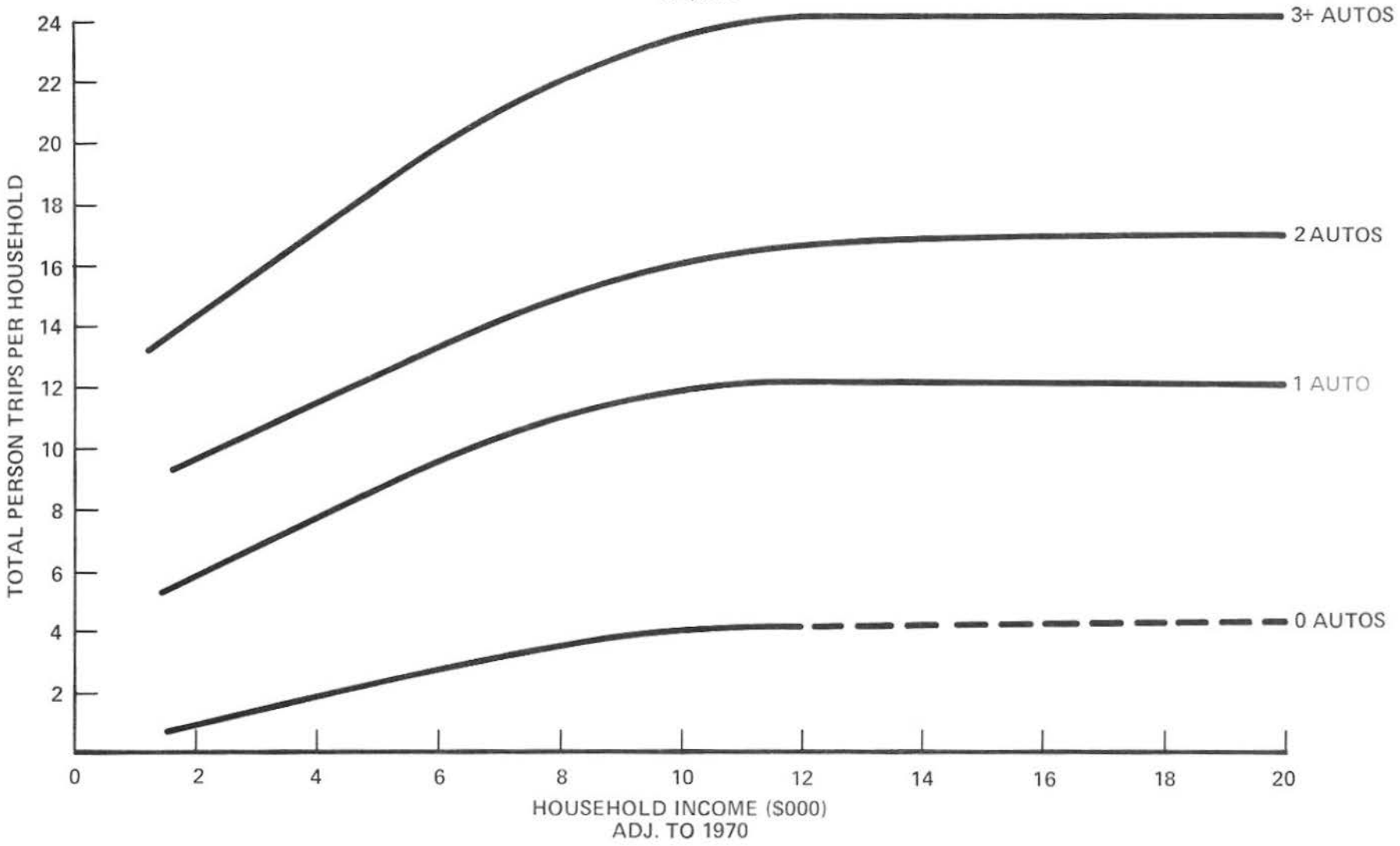
57,300 (1967)

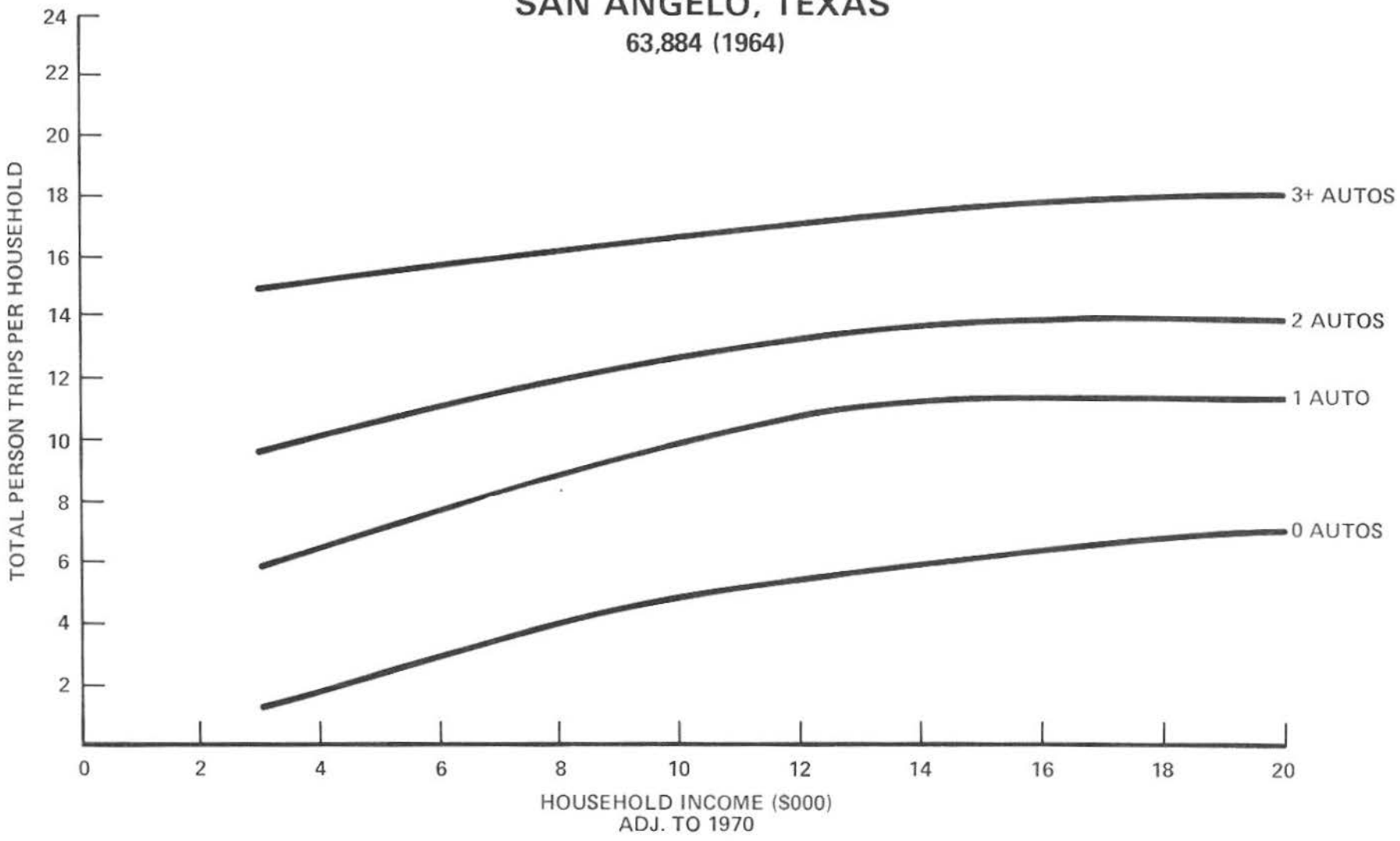


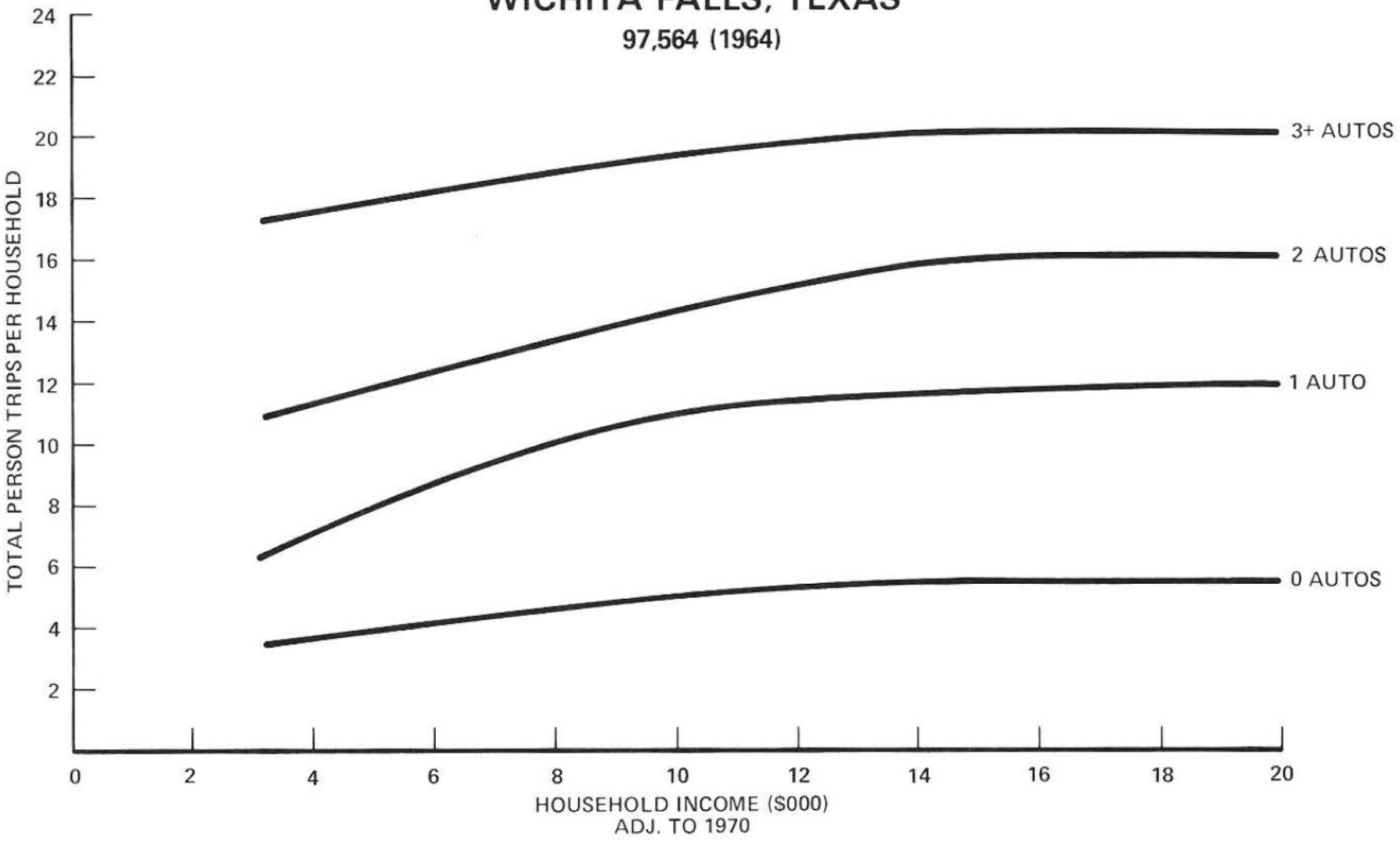

TEXARKANA, ARKANSAS-TEXAS
58,570 (1965)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

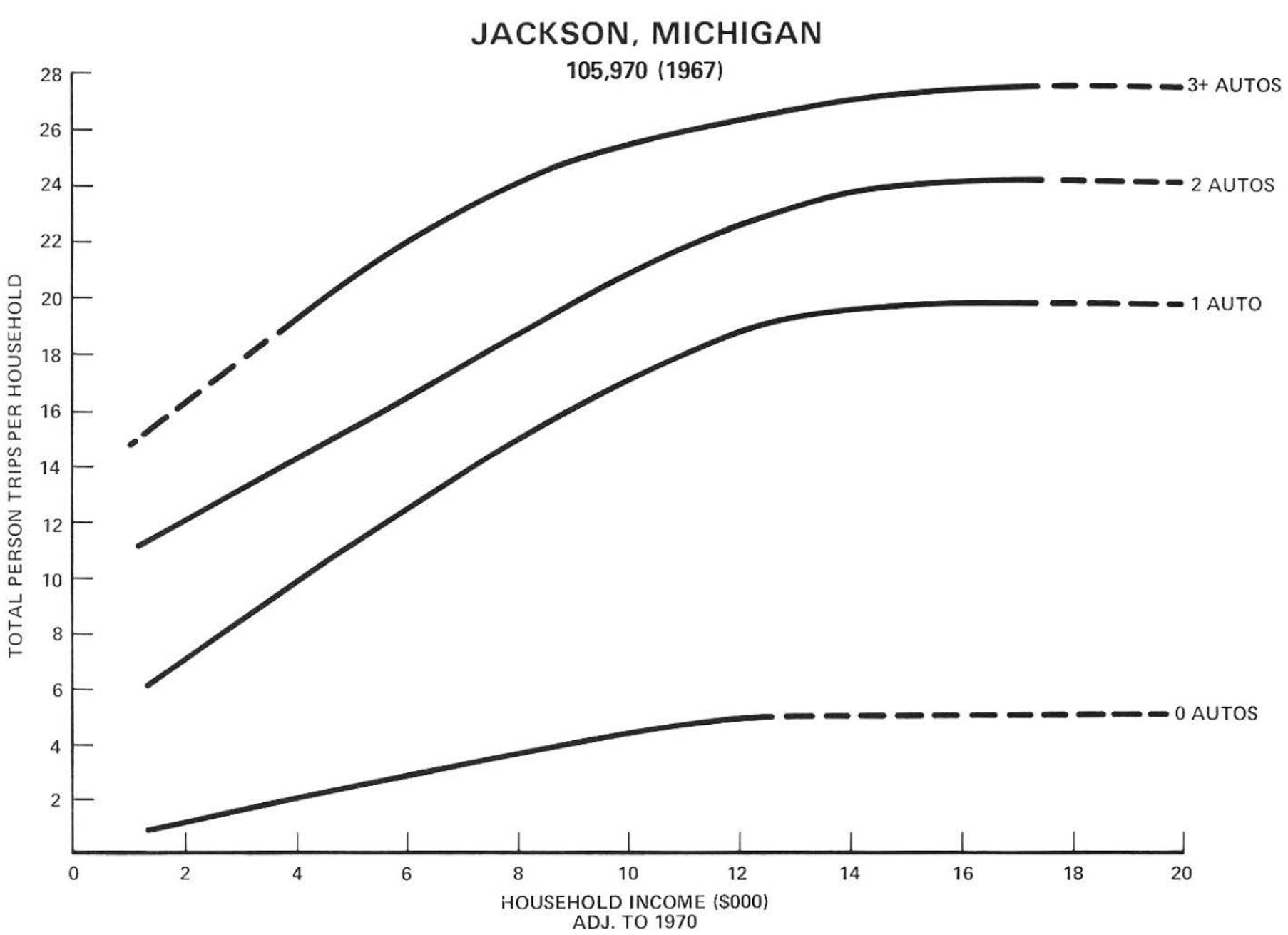
SALINAS-MONTEREY, CALIFORNIA

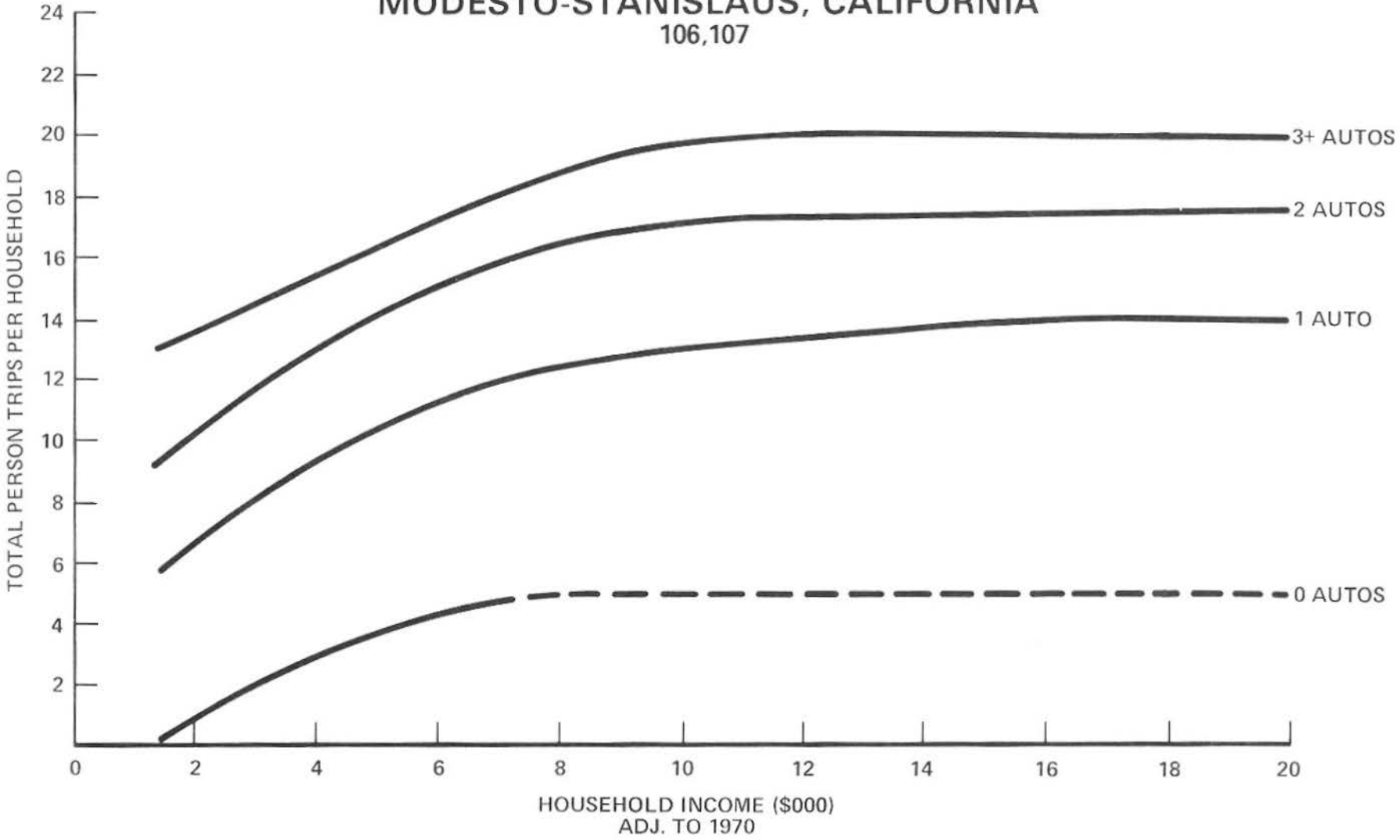
62,456

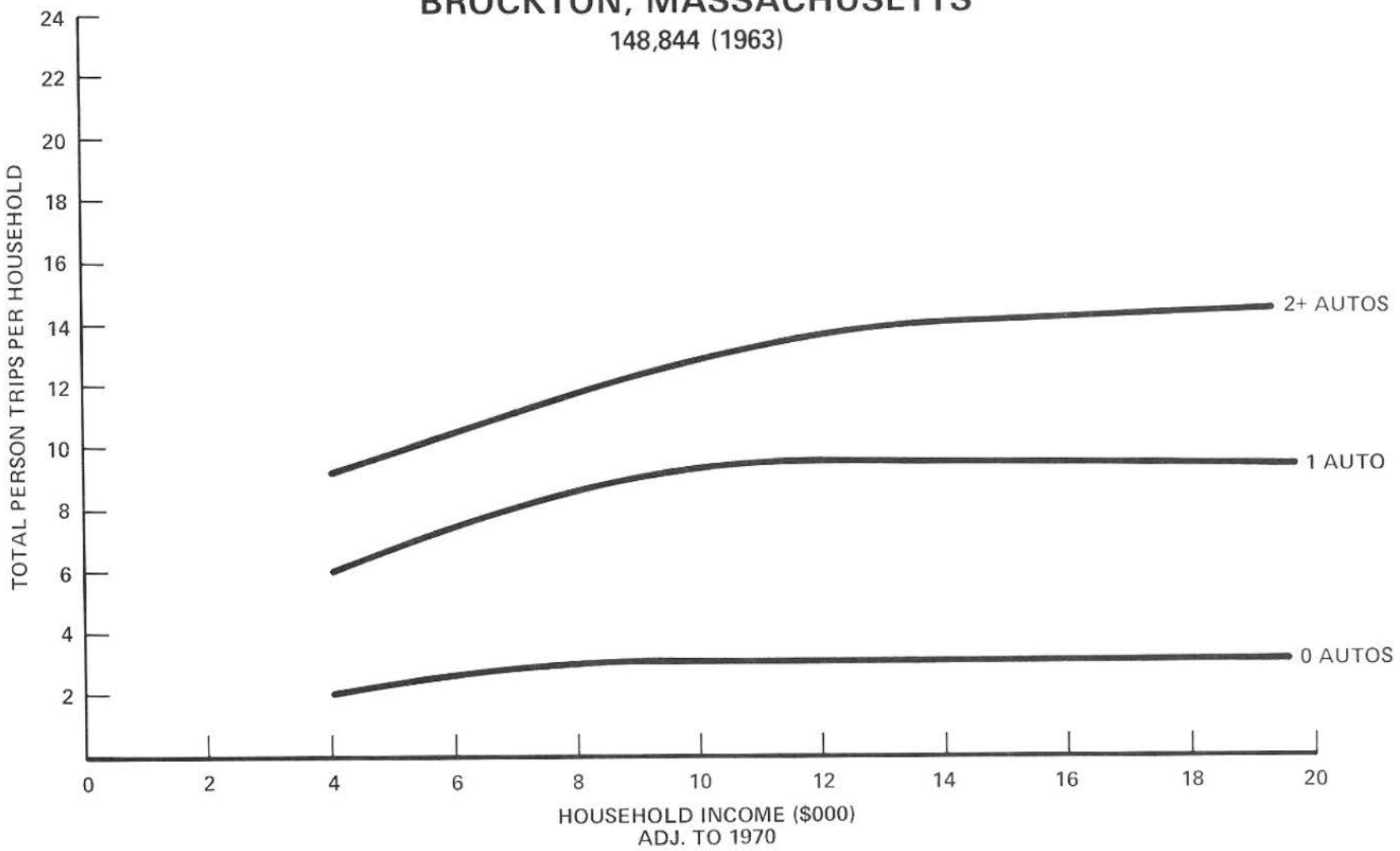


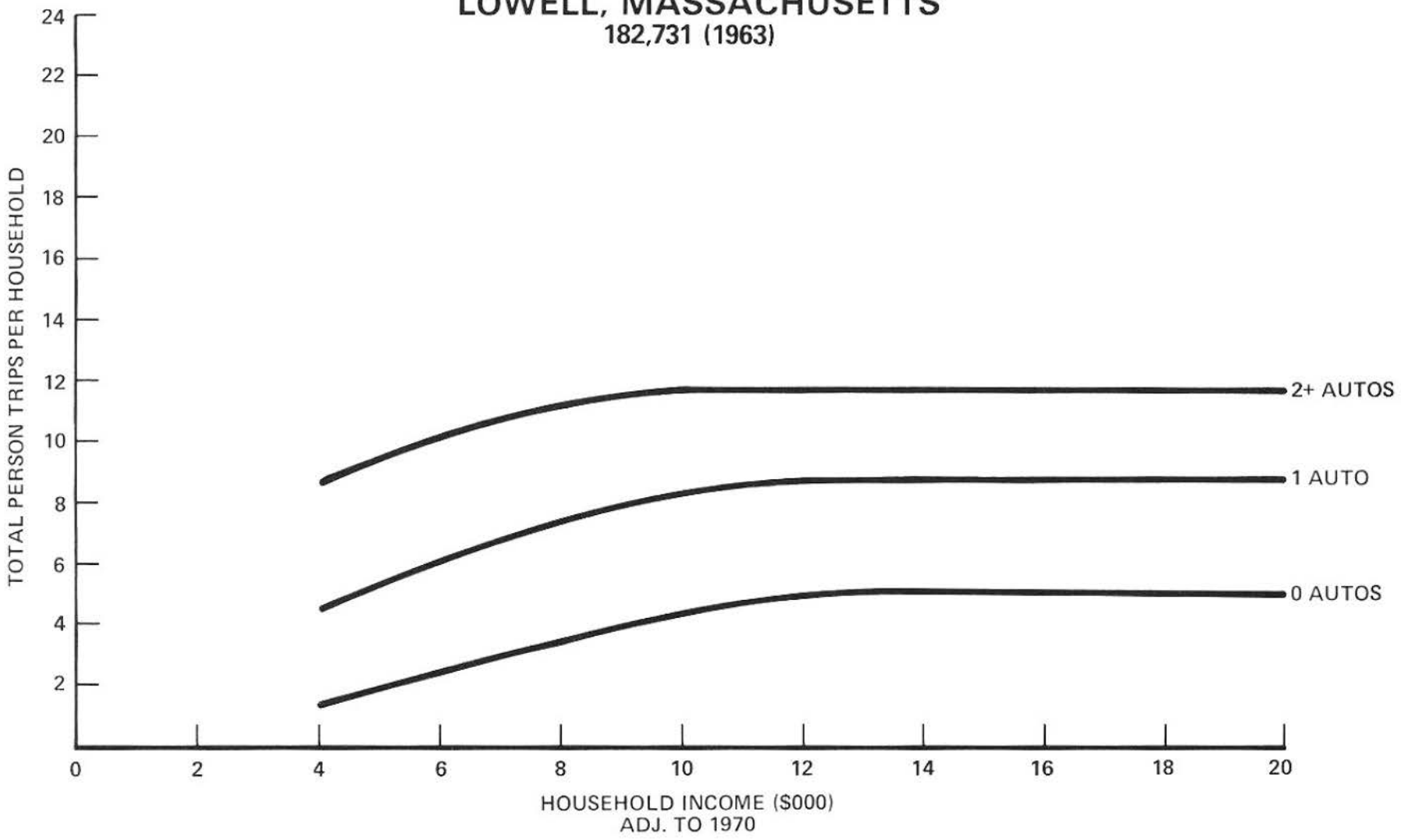

SAN ANGELO, TEXAS
63,884 (1964)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

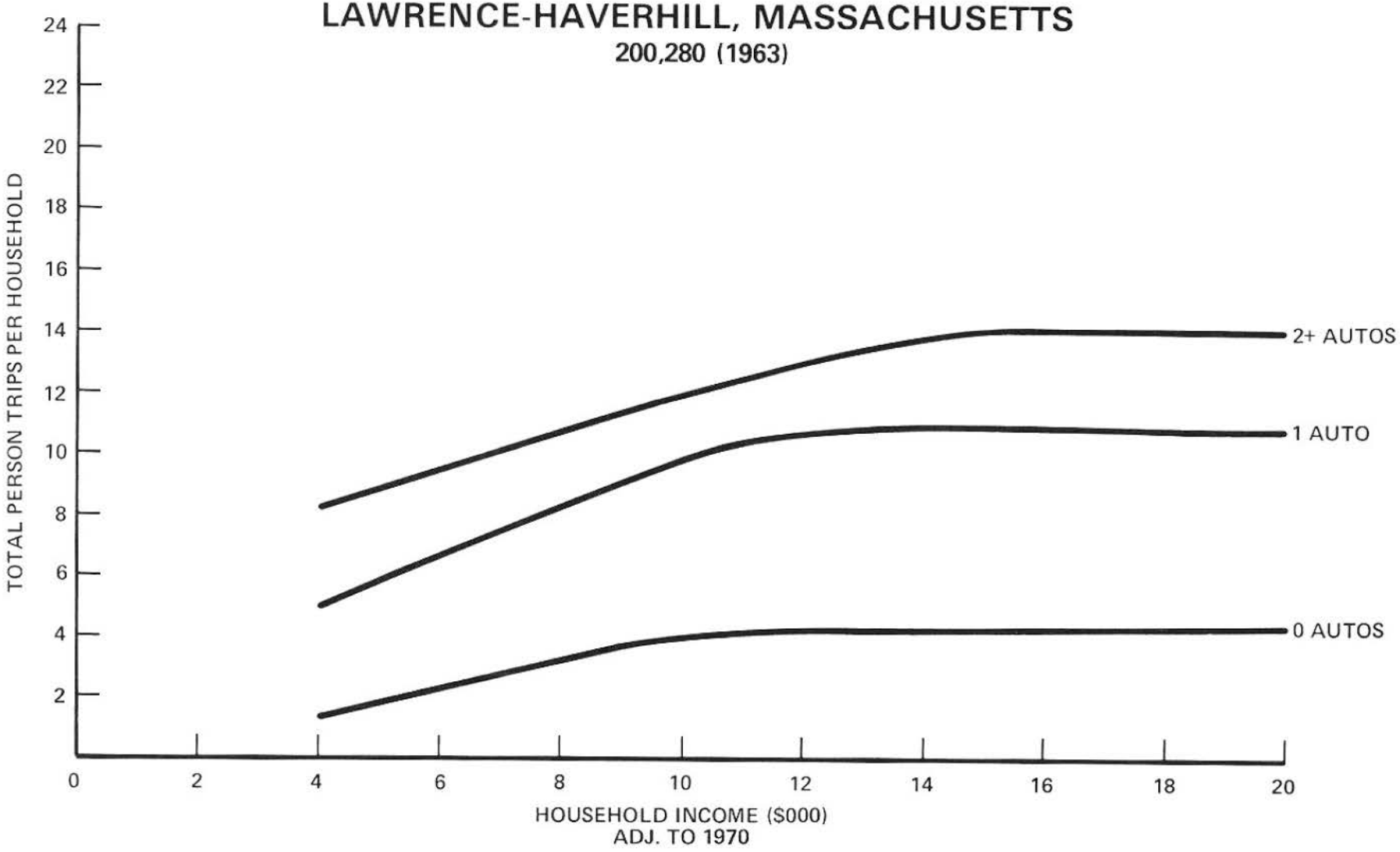

WICHITA FALLS, TEXAS
97,564 (1964)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

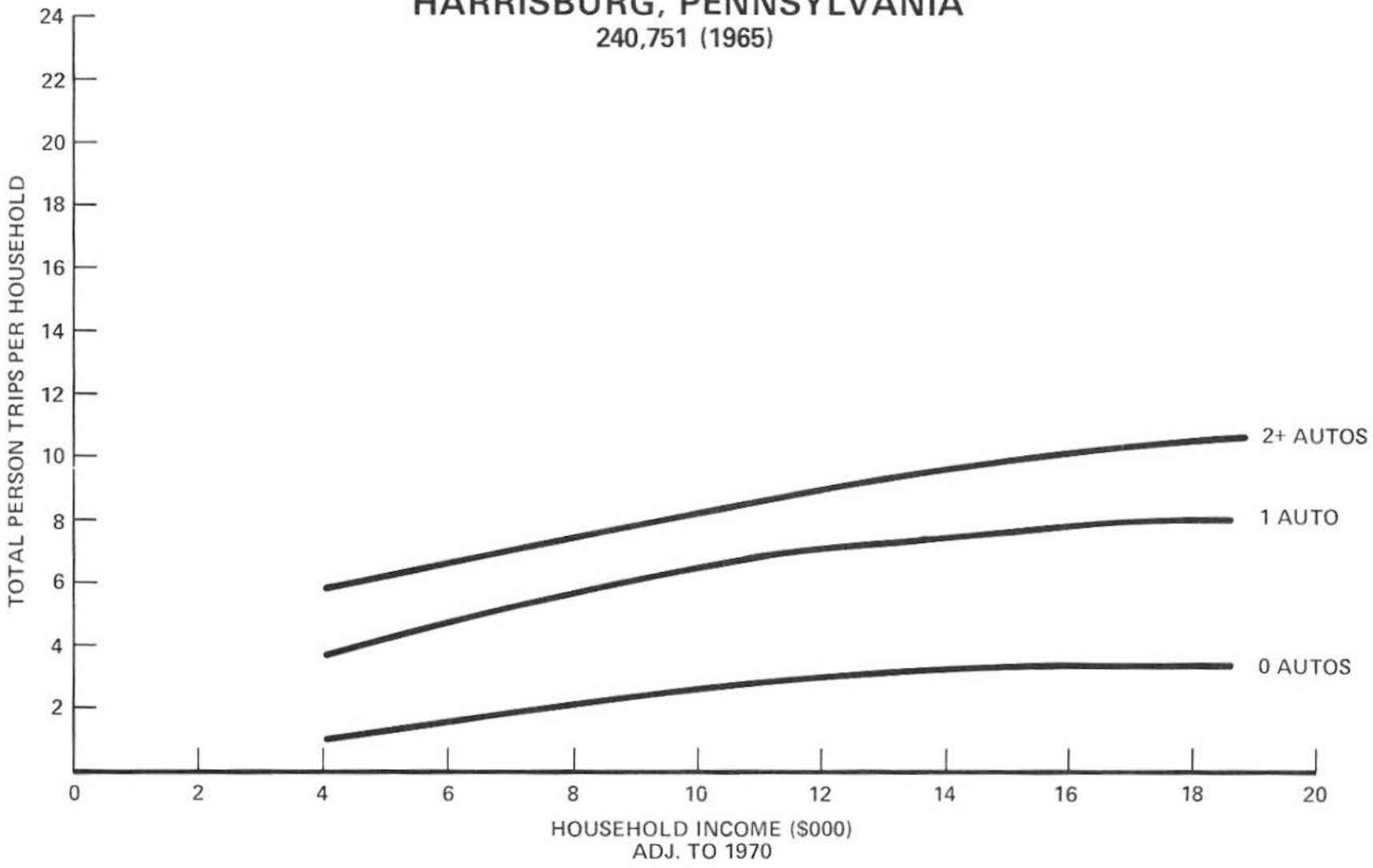

JACKSON, MICHIGAN
105,970 (1967)
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
TOTAL PERSON TRIPS PER HOUSEHOLD
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

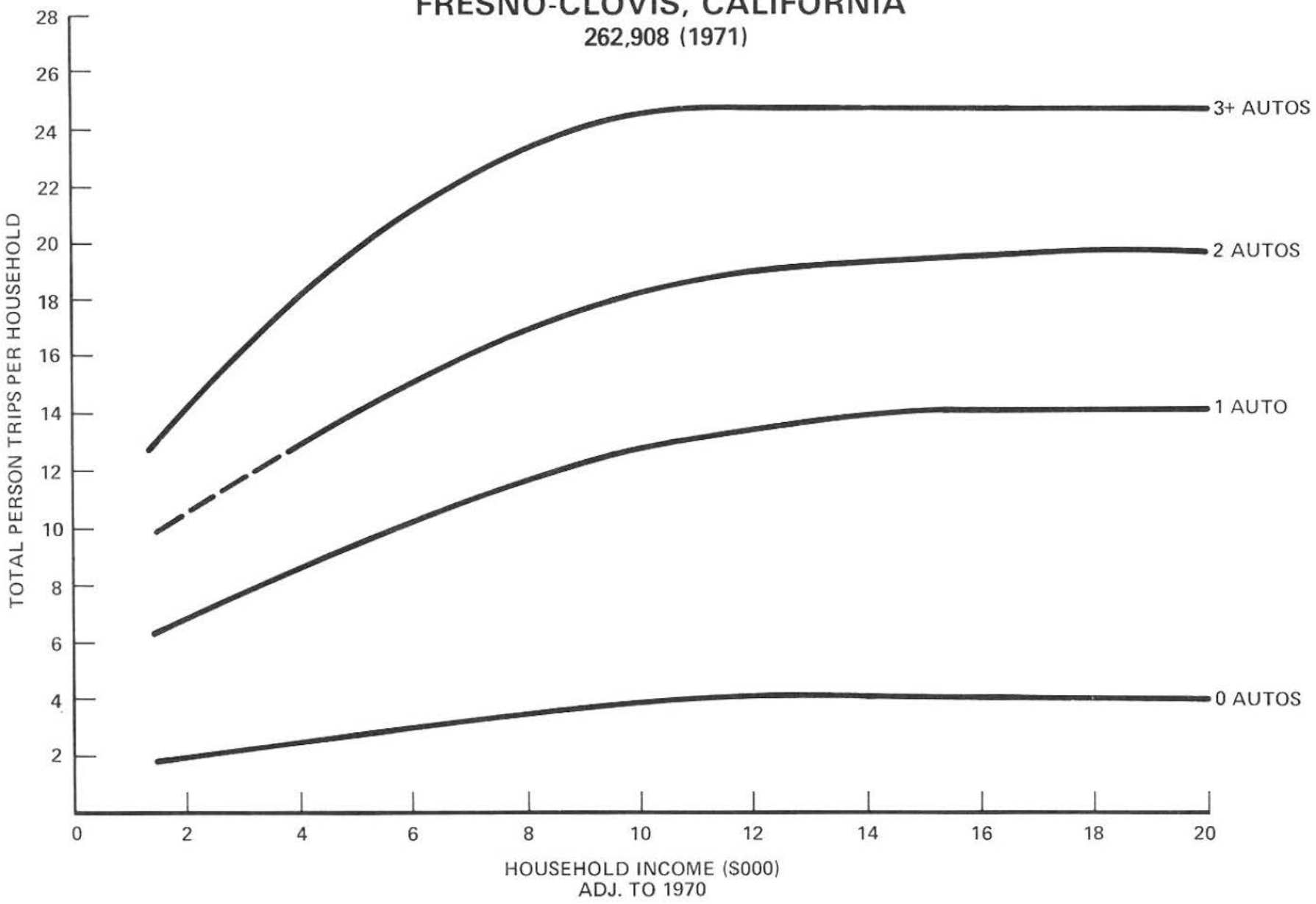

MODESTO-STANISLAUS, CALIFORNIA
106,107
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

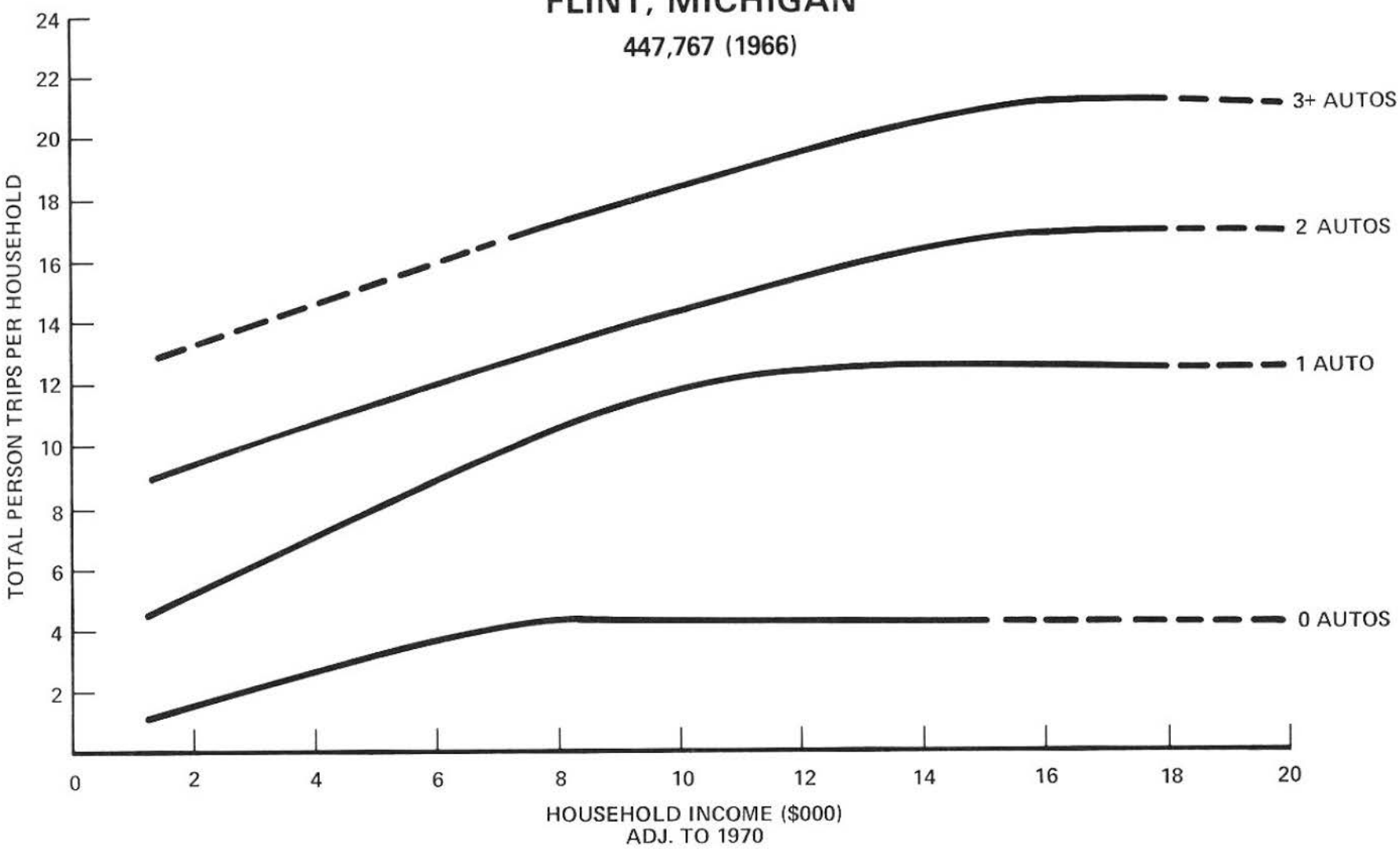

BROCKTON, MASSACHUSETTS
148,844 (1963)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
2+ AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

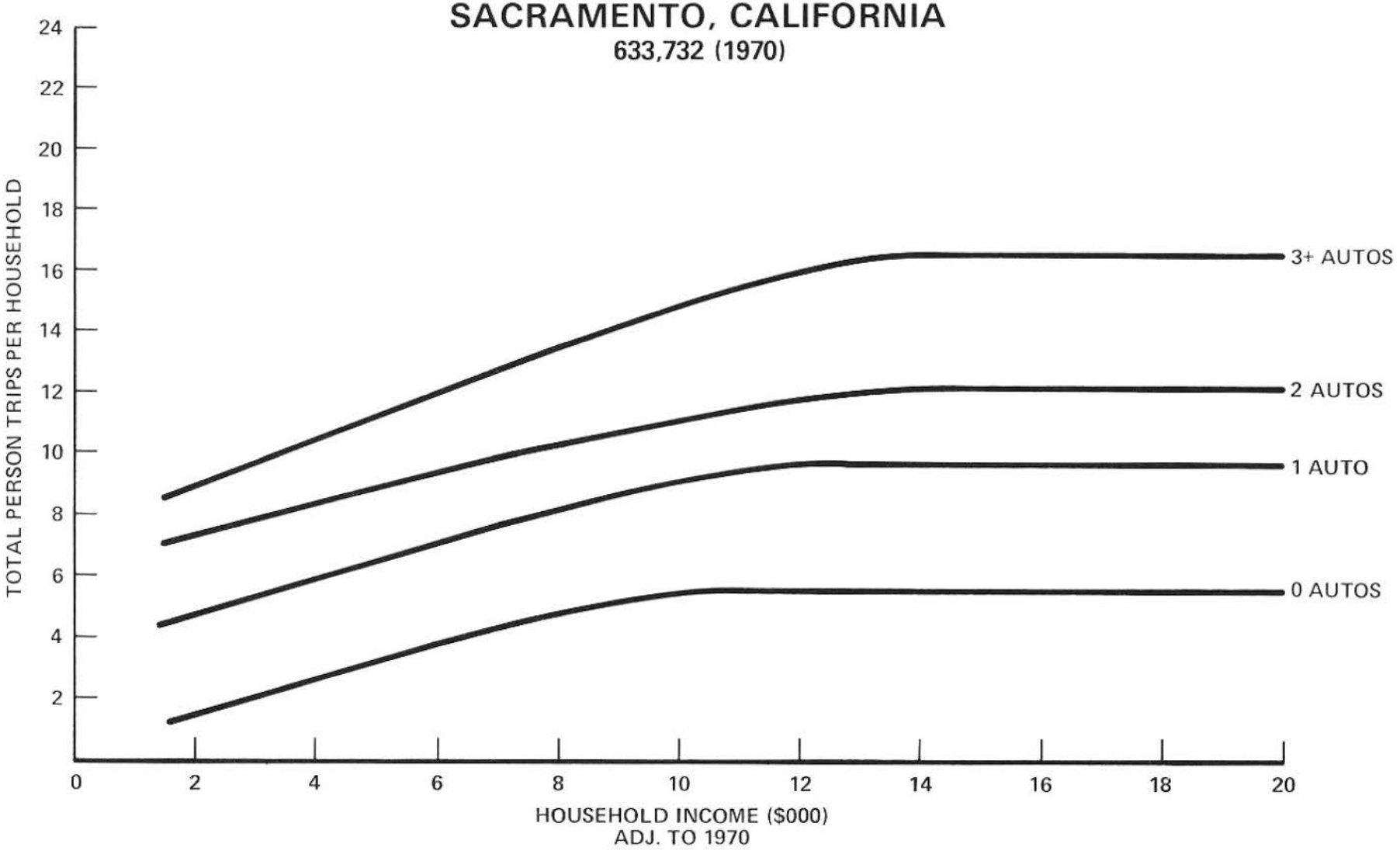

LOWELL, MASSACHUSETTS
182,731 (1963)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
2+ AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

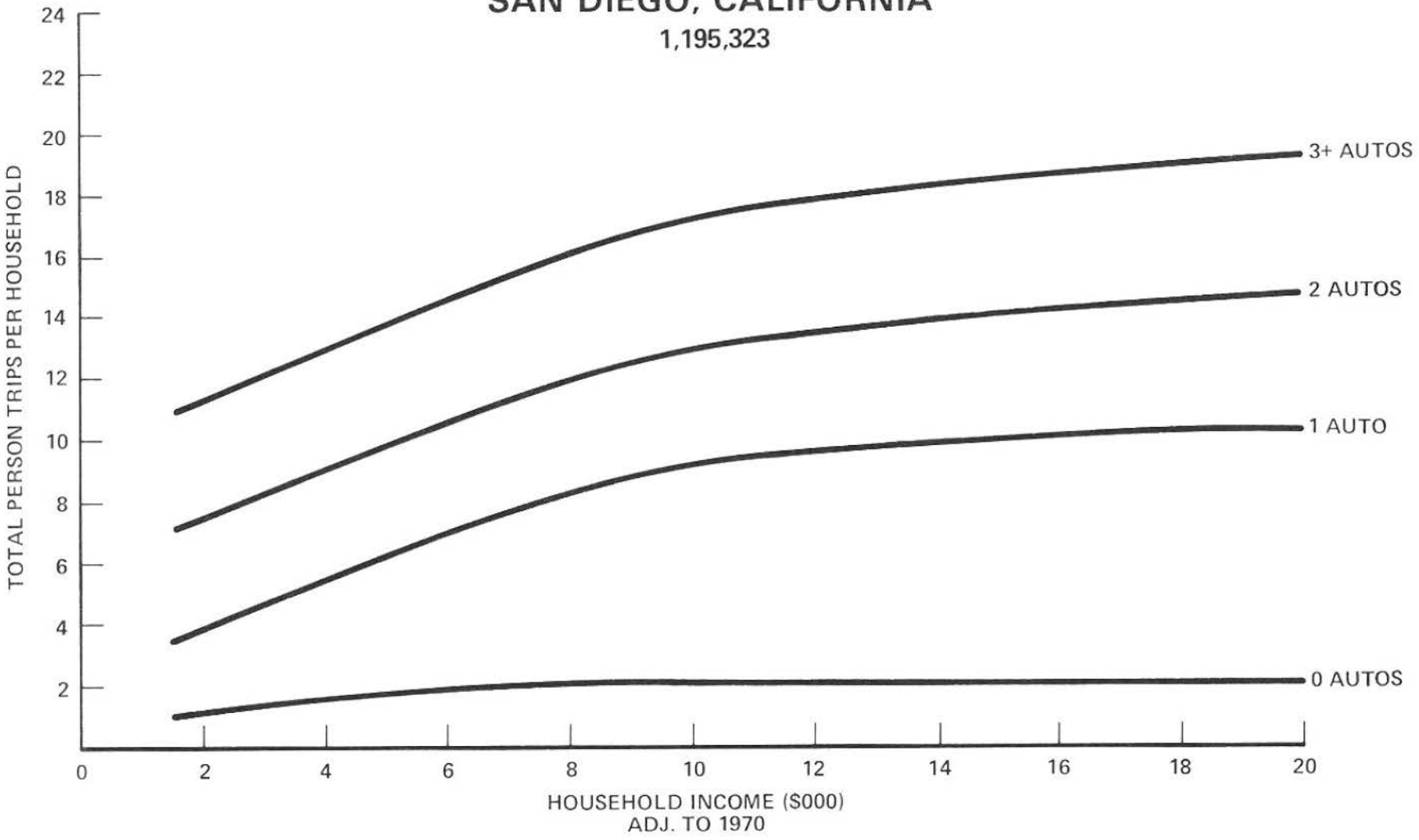

LAWRENCE-HAVERHILL, MASSACHUSETTS
200,280 (1963)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
2+ AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

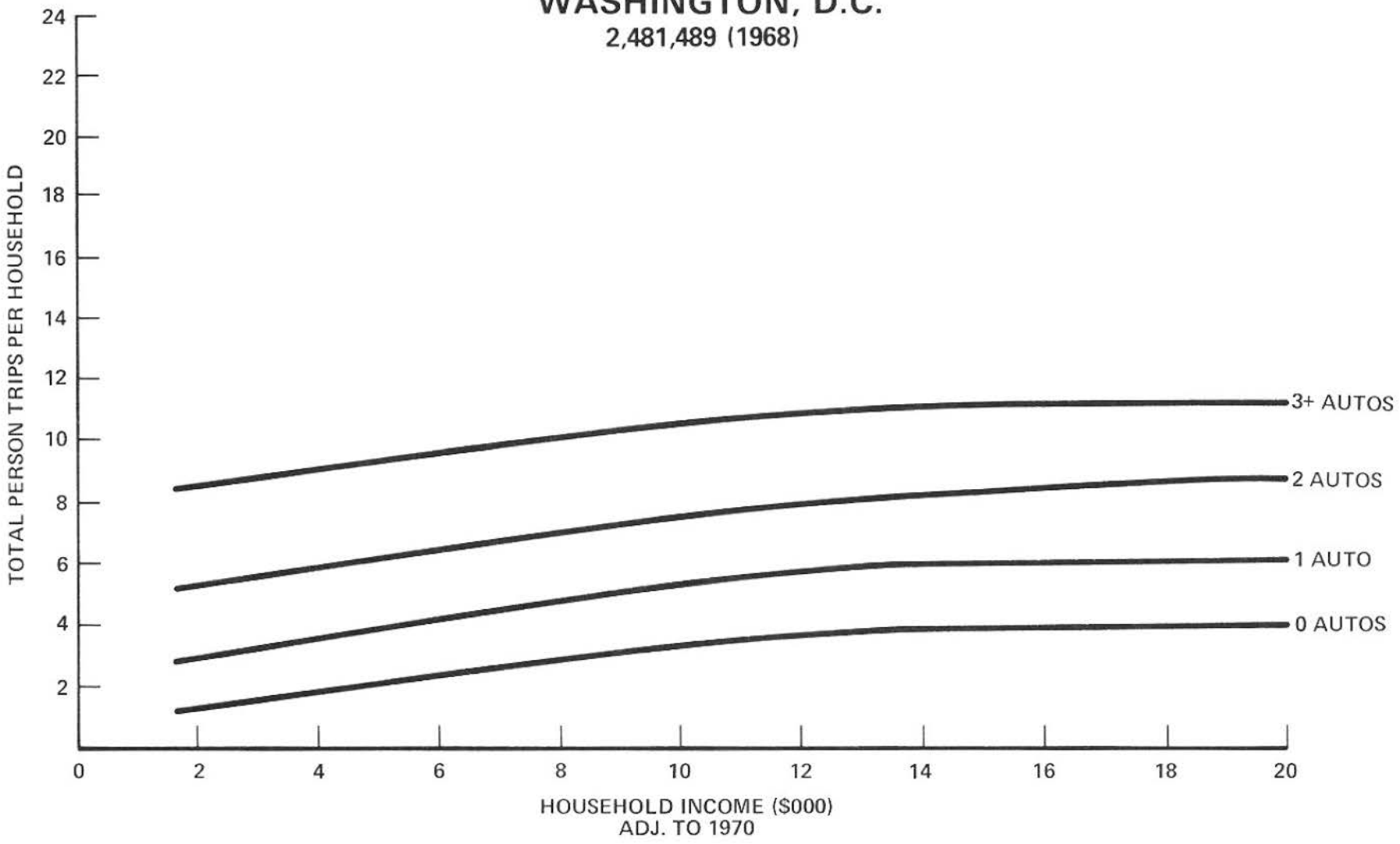

HARRISBURG, PENNSYLVANIA
240,751 (1965)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
2+ AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

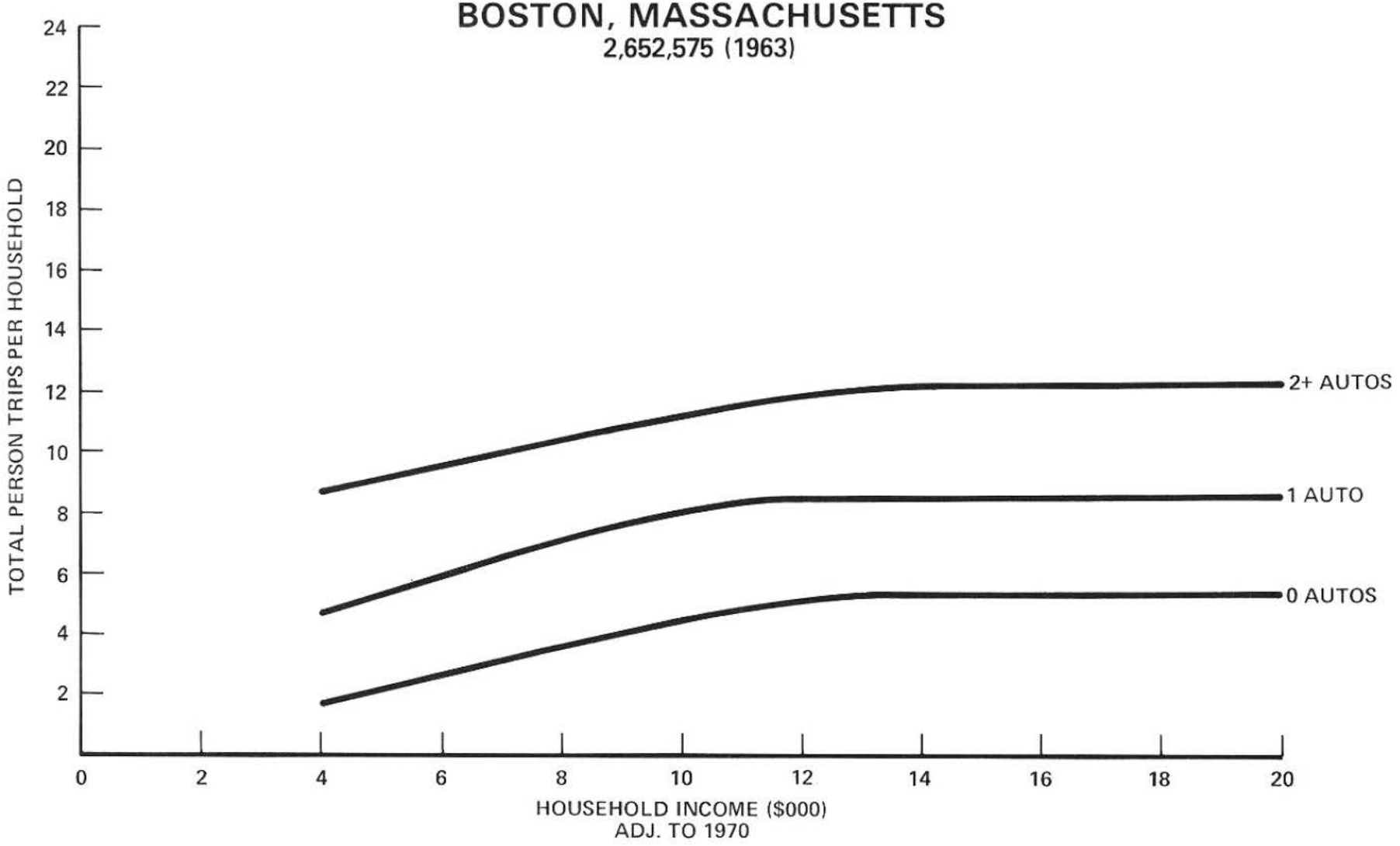

FRESNO-CLOVIS, CALIFORNIA
262,908 (1971)
TOTAL PERSON TRIPS PER HOUSEHOLD
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME (S000)
ADJ. TO 1970
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS


FLINT, MICHIGAN
447,767 (1966)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970


SACRAMENTO, CALIFORNIA
633,732 (1970)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS

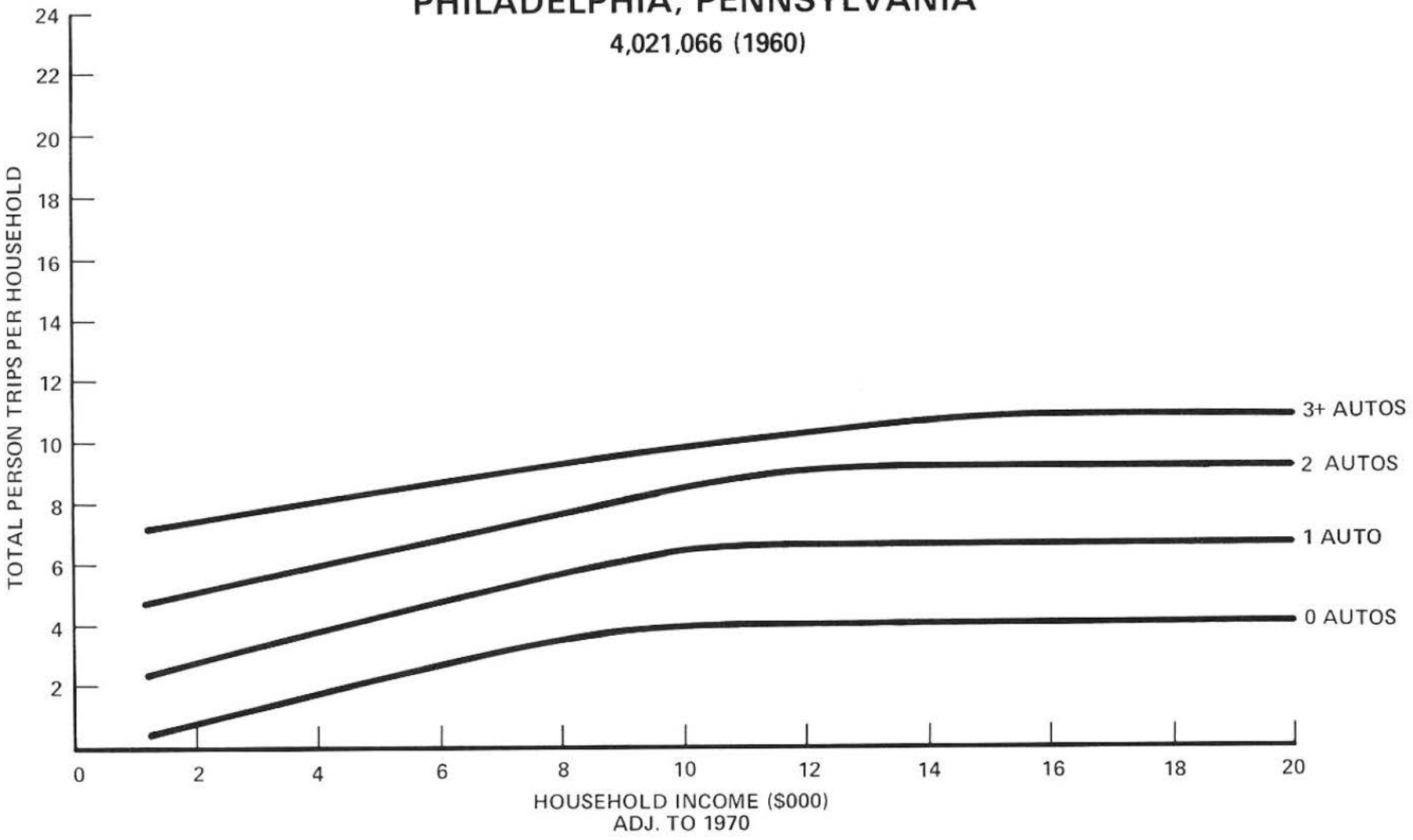

SAN DIEGO, CALIFORNIA
1,195,323
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

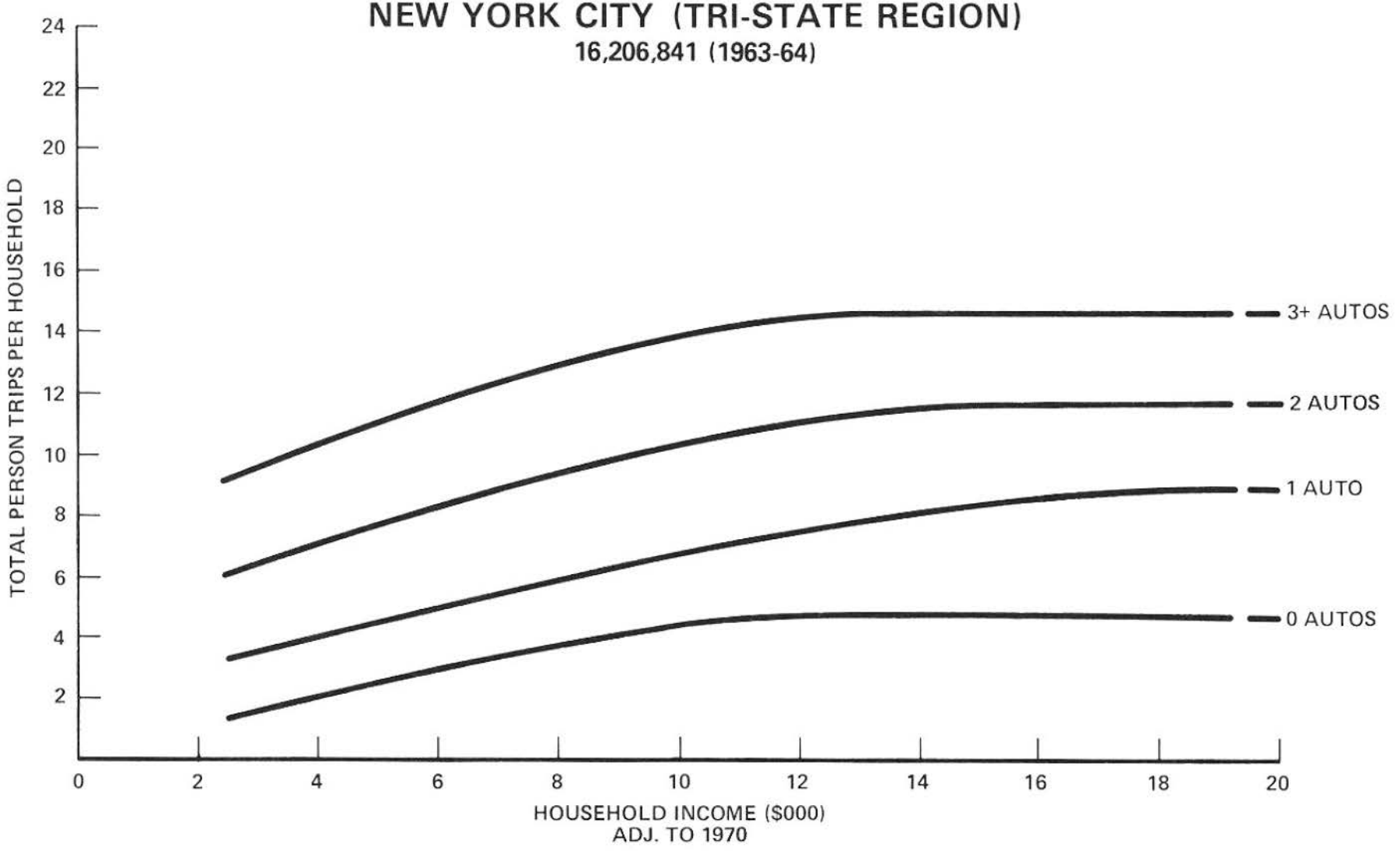

WASHINGTON, D.C.
2,481,489 (1968)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS
HOUSEHOLD INCOME ($000)
ADJ. TO 1970


BOSTON, MASSACHUSETTS
2,652,575 (1963)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
2+ AUTOS
1 AUTO
0 AUTOS
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970

PHILADELPHIA, PENNSYLVANIA

4,021,066 (1960)




NEW YORK CITY (TRI-STATE REGION)
16,206,841 (1963-64)
TOTAL PERSON TRIPS PER HOUSEHOLD
24
22
20
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
12
14
16
18
20
HOUSEHOLD INCOME ($000)
ADJ. TO 1970
3+ AUTOS
2 AUTOS
1 AUTO
0 AUTOS