

INSTRUCTIONS FOR REPORTING HIGHWAY TRAFFIC AND ACCIDENTS 1/

Introduction

(TAI-1) 2/ Annual highway traffic and accident data are basic information needed for evaluation and guidance of continuing State, local, and national highway safety programs. Traffic and accident information is also basic to many other aspects of highway planning, design, and administration. Due to the intense interest in highway safety on the part of the public, government officials, and many organizations, it is important that comprehensive accident data be available to highway officials at the national level as soon after the end of the year as possible. Thus, these procedures provide for estimating and grouping data where necessary to meet the April 1 completion date. The procedures have been developed to provide for regular reporting of consistent comparable traffic and accident data in a meaningful form. Detailed studies of traffic accidents continue to indicate a variety of relationships between various contributing factors. To properly interpret these data and determine policies and procedures which will use available resources with maximum effect, this comprehensive framework relating accidents to administrative control and travel is essential.

Sources of Data

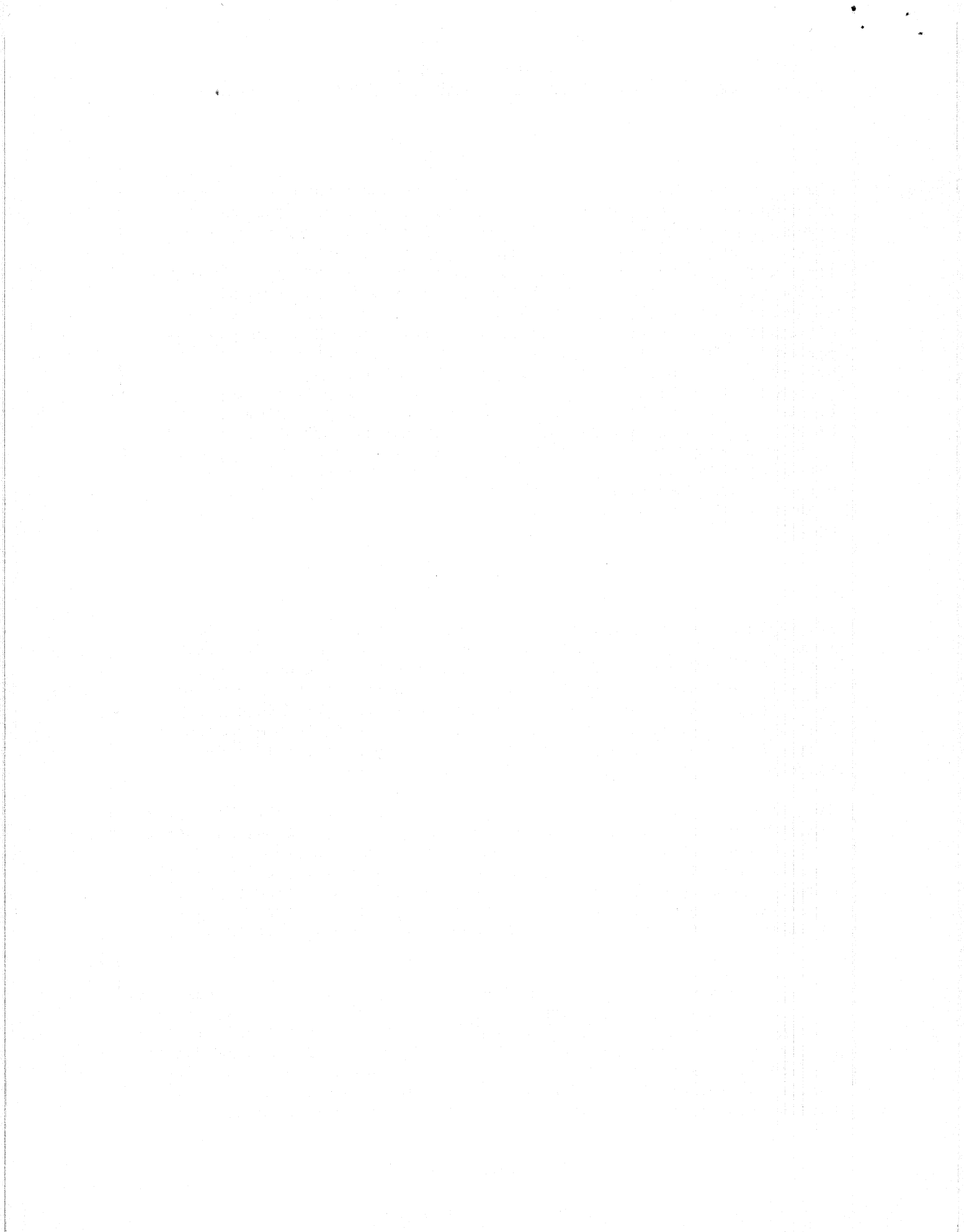
Highway mileage and traffic data are readily available within the highway departments from the continuing statewide highway planning activities conducted in all States since 1936. The motor vehicle registration, driver licensing, and fuel consumption data needed for estimating total travel are readily available to highway departments from the several State agencies. These are provided to the Bureau of Public Roads for annual publication in "Highway Statistics" after adjustment to provide comparability between States.

(CM-1) The prompt submittal of table TA-1 by April 1 is important. Since some States do not have their final system mileage data completely summarized before June, estimates will be necessary in certain categories. A feasible procedure is to recompute the prior year TA-1 data using final system mileage and traffic data. From this base, and using the best information available concerning new mileage opened to traffic, shifts in mileage assignments to State and Federal-aid highway systems, and

1/ Enclosure to IM 50-1-68, "Annual report of travel and accidents."

2/ (TAI-1) indicates text from page 1 "Instructions for Reporting Highway Traffic and Accidents" with IM 50-7-66, November 2, 1966; (CM-1) indicates text from page 1 of Mr. E. H. Holmes' Circular Memorandum of December 12, 1966; (FA-10) indicates text from page A-10 of Appendix A "Guide for Forecasting Traffic on the Interstate System for the 1968 Cost Estimate;" (*) indicates new or extensively revised text.

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- past trends, figures having sufficient reliability for table TA-1 can be developed. Since the table TA-1 data will be adjusted later to agree with those published in "Highway Statistics," it is important that TA-1 data be as consistent with these data as feasible. Due to the need for uniform nationwide adjustment procedures, these figures are frequently slightly different from the corresponding value reported in a State's PR-500 series forms. By applying trend ratios from the State's PR-500 forms for the two years to the base year value from "Highway Statistics" usable values can be estimated.
- (CM-1)
- (CM-2) The rural-urban-municipal definitions used for the 12 highway systems for table TA-1, as well as for other planning studies, sometimes causes concern. The 12 systems were developed to provide a breakdown related to administrative responsibility for highways and streets. The Federal-aid rural and urban definitions are related to the various categories of Federal-aid funds, while for the State and local mileage not on a Federal-aid system, it is necessary to use the rural and municipal categories. In most States, this relates to county and township roads in rural areas and village and local city streets in municipalities. As indicated in pages iv and v of the "Instruction Manual for the Compilation and Reporting of Highway Mileage," Highway Planning Program Manual, Volume 20, Appendix 22, a political subdivision providing general local government for a population concentration is the primary criterion. Where a State is providing a satisfactory form PR-528 and related mileage reporting forms, there should be no unusual difficulty in developing the mileage data needed for table TA-1. The system descriptions and the interrelationships to form PR-528 provided on pages 16 and 17 of the instructions are intended to clarify this. It is recognized that this does not provide completely consistent representation of traffic characteristics, particularly for some county roads (code 11) within large urbanized areas. A completely consistent breakdown which provides the 12 system administrative classification, municipal under 2,500 population, urban 2,500 to 4,999, urban 5,000 to 49,999, and urbanized 50,000 and over by municipal and nonmunicipal involves more than 200 categories and was, therefore, not considered for this report. If an unusual condition or extreme inconsistency results in a State, this should be described in the transmittal memorandum prepared by the division office.
- (TAI-1) Accident data are collected by a variety of State, local, and national agencies and authorities. Therefore, each highway department must, of necessity, take the responsibility for developing the necessary arrangements, in cooperation with other interested State and local agencies, for the timely reporting of the accident data needed for the completion of table TA-1.
- (CM-4) It is evident that there are difficulties in determining the number of accidents and highway system for accidents which occur off the State highway system. Provisions have been made to report data in the greatest detail feasible. On the other hand, it is generally recognized that

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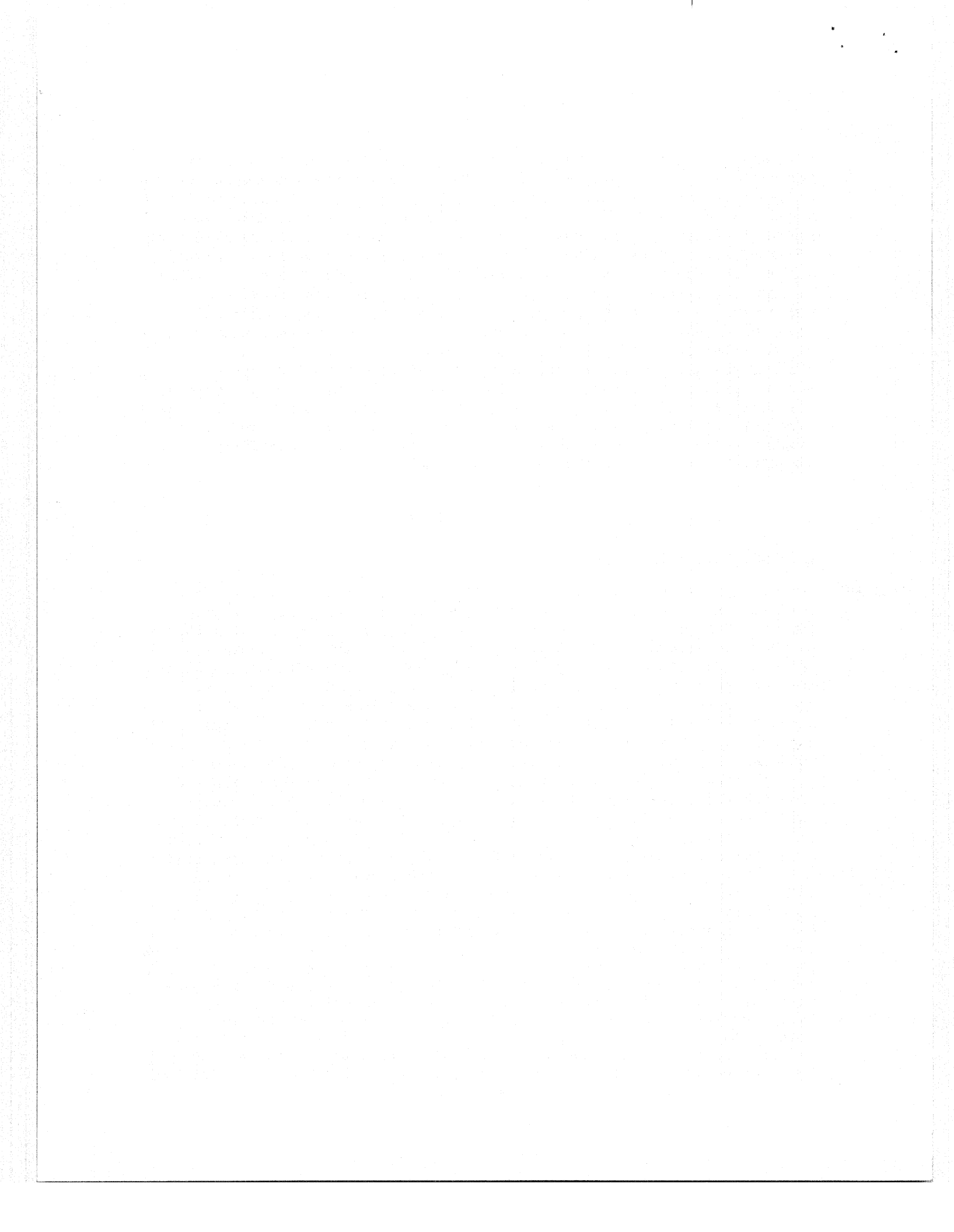
analysis of fatal and nonfatal injury motor vehicle traffic accidents for the State as a whole, as well as for the State administered highway system mileage, is a continuing highway planning responsibility of the highway department. While certain details concerning accidents must remain confidential, information relative to the occurrence and location of fatal and nonfatal injury accidents is public information. In many States, it appears that the most reliable and convenient source of this information is the accident report files of police departments or a motor vehicle or safety agency. These files may include confidential information which may not be disclosed. It has been evident that when responsible public officials in the few jurisdictions, where this problem was not previously resolved, understood the need for the data and the problem involved, they quickly developed procedures to provide the necessary information. In the meantime, highway planning officials have been generally successful in developing alternative procedures for obtaining the data since other sources of data having reliability adequate for table TA-1 are usually available.

Summarization of Data

Mileage and traffic data

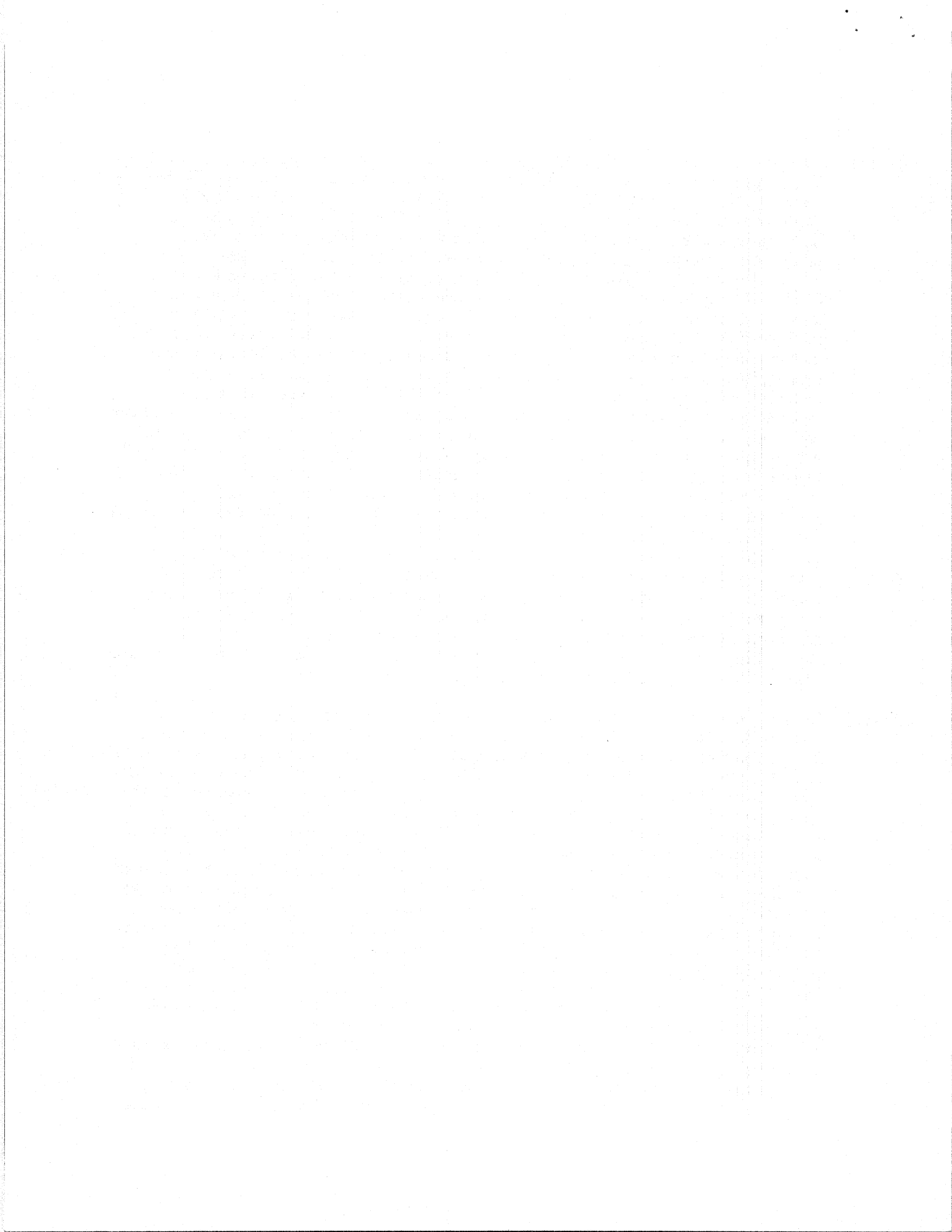
- (TAI-4) The mileage, annual vehicle-miles of travel, and daily vehicle-miles per mile, in columns 1-5, should be shown for every highway category for which there is road mileage reported, and for all resulting subtotals as shown in example table TA-1, page 15. Table A, page 16, shows the relationship between highway system code and the form PR-528 and related mileage reports. Table B, page 17, shows the codes for all highway systems in each subtotal category. Separate values should be shown in parentheses: a) for toll sections, b) for nontoll freeway mileage on all applicable systems other than completed Interstate, and c) for frontage roads not reported by administrative systems on form PR-528. These parenthetical values should be directly below the entry for the system of which they are a part, as shown for "toll" on system 01, "frontage roads" on system 02, and for "full control of access" on systems 04 and 12 in the example table. In the case of toll roads and freeways, these parenthetical values in columns 1 through 13 account for mileage, travel, and accident values that are included in the system entries. In the example table on page 15 mileage and traffic data are shown for all lines, although accident data are not available for systems 07, 11, and certain related subtotals while for systems 08 and 12, only fatal accident data are available. The example table also shows "(Full control of access)" under systems 04 and 12 only, "(Toll)" under system 01 only, and "(Frontage road)" under system 02 only. It is intended, of course, that these categories be shown for each system to which they apply.
- (CM-4) *
- * Where complete data are available for each of the systems having road mileage in column 1, only those subtotal lines indicated by an asterisk (*) are required. Parenthetical subtotals, rural and urban, should be provided as shown in the example for "(Full control of access)" including completed Interstate and appropriate toll mileage.

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- (FA-10) The mileage for each highway system category shown in column 1 (table TA-1) should agree with the values reported in forms PR-511 and PR-528 for December 31 by the division office and the State, respectively. Instructions for completing form PR-511 in PPM 10-6, June 30, 1966, "Interstate System Status Report," Highway Planning Program Manual, Volume 20, Appendix 3, require Interstate mileage to the nearest 0.01 mile. Instructions for form PR-528, Highway Planning Program Manual, Volume 20, Appendix 22, "Instruction Manual for the Compilation and Reporting of Highway Mileage," do not require a finer reporting than the nearest mile, although most States report to 0.1 or 0.01 mile. Mileage figures should be shown to the same decimal positions as shown in the corresponding PR-528 prepared by the State. Mileage in table TF-1 is to be as of December 31. A copy of form PR-528 with the table TA-1 categories indicated for each cell is shown on page 16. The respective rural and urban mileage figures to be shown in table TA-1 for codes 01 and 02 are to equal the total mileage shown for both full and partial access control under status group 1, and all toll mileage under status group 6 in the PR-511 forms. Mileages for codes 31 and 32 are then obtained by subtracting these mileages for codes 01 and 02 from the total Interstate mileages shown in columns 1 and 2 of the PR-528. Column 2 shows the percentage distribution of total State mileage by highway system, while similar distributions of vehicle-miles will be shown in column 4. Percentages should be calculated to two decimal positions. Daily vehicle-miles per mile--a weighted average ADT--are to be shown for each system in column 5. These values are calculated by dividing the values for vehicle-miles of travel by miles of road and then dividing this quotient by 365 days and should be shown to units.
- (FA-11) In the lower part of the table entries for registrations, motor fuel, and population are related to travel and should be entered in column 3. The number of vehicles registered, gallons of fuel consumed, and licensed drivers should be consistent with data reported in forms PR-561, PR-551, and PR-562, respectively. These data are the basis for tables MV-1, MF-21 (formerly G-21), and DL-1 (formerly MV-12), respectively, published in "Highway Statistics." The figures for motor vehicles registered, fuel consumed, and licensed drivers should be based on the figures for the previous year in the column "All motor vehicles, total" in table MV-1, the column "Summary of total usage, highway, amount" in table MF-21, and the column "Estimated total licenses in force" in table DL-1. These values may be estimated for the current year by applying ratios based on corresponding entries in forms PR-551, PR-561, and PR-562 for the two years. The population figures should be the latest official estimates of July 1 total resident population, United States Bureau of the Census, "Current Population Reports, Population Estimates, Series P-25." Annual miles per vehicle, calculated by dividing the number of motor vehicles registered into the total vehicle-miles of travel on all systems, should be shown to the nearest mile. "Miles traveled per gallon," calculated by dividing the gallons of motor fuel into the total vehicle-miles of travel, should be shown to two decimal positions. Persons and licensed

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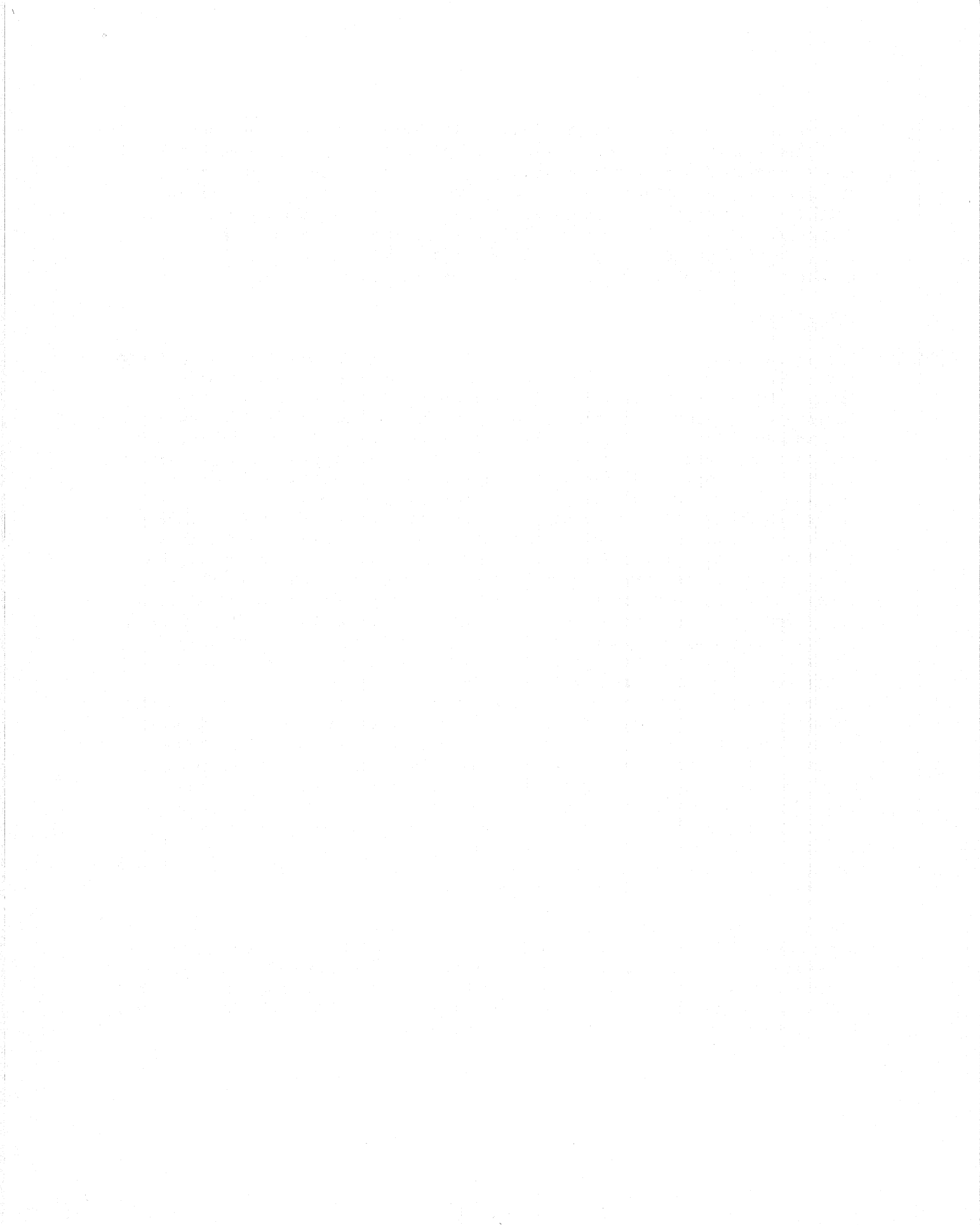
drivers per vehicle are calculated by dividing the figure for motor vehicles registered into population and licensed drivers, respectively, and should be shown to two decimal places. Annual travel per capita, and per licensed driver calculated by dividing the appropriate figure into that for total vehicle-miles, should be shown to the nearest mile. The number of decimal positions indicated provide three or more significant figures for nearly all entries. This is necessary to avoid excessive difficulty from rounding in the adjustment process.

Travel data

(FA-12) The annual vehicle-miles of travel to be shown in column 3 of table TA-1 may be determined from actual counts on each highway system in some States, but in most cases it will be necessary to make estimates for certain categories. For the traveled mileage of the Interstate System, counts made within the last four years are available in most States and can be conveniently summarized from the Interstate System Traveled-way Traffic Flow Map, IM 50-8-66, Highway Planning Program Manual, Volume 20, Appendix O. Current traffic data are usually available for rural and urban State system mileage on the Federal-aid primary and secondary system, as well as other State mileage with more limited traffic data for local roads. ADT figures for years other than the current year may be adjusted to the current year by factors based on annual trends or other counts on comparable road sections. Other sources of useful data are forms PR-505 and PR-506 summarizing road mileage by traffic volume group, surface type, and width, for the Interstate, other Federal-aid primary system, and State primary systems. Annual vehicle-miles can be estimated from these data by multiplying the mileage in each class interval by the midpoint ADT for the interval, summing the products, and multiplying by 365 days. Travel by highway system can be determined in urban areas where a transportation study has been conducted, and used as an aid for estimating travel in other cities on the basis of population, density, vehicles registered, and street mileage. The mileage data for local roads and streets by surface type and width, as reported in forms PR-521, PR-522, and PR-523 will provide guidance in estimating reasonable average traffic volumes for the corresponding mileage. Where current year data are not complete, the data for the previous year should be used as a base and updated by trend ratios.

The annual reports of the Bureau of Public Roads, "Highway Progress," show State mileage by Federal-aid system. PUBLIC ROADS, Vol. 32, No. 11, December 1963, contains a summary of motor-vehicle-use and census data concerning automobile usage. Articles concerning motor fuel consumption rates for trucks and automobiles were published in PUBLIC ROADS, Vol. 31, No. 1, April 1960, and Vol. 32, No. 5, December 1962.

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The total vehicle-miles of travel for a State can be estimated from total fuel consumption based on a weighted average fuel consumption rate. A nationwide rate of miles per gallon is published annually in table VM-1. Average miles per vehicle when related to the number registered, provide another check on total vehicle-miles of travel. Average annual travel in miles per vehicle is published annually in table VM-1.

* Most States have miles per gallon and annual miles per vehicle rates significantly different from national averages. Population and licensed drivers related to vehicle registrations and travel provide another means of estimating total travel when used with motor-vehicle-use study data and other census information. The daily vehicle-miles per mile in column 5 are weighted average ADT figures. In general, the higher category systems have higher traffic volumes, with the urban mileage of a given system having higher volumes than the rural mileage of the same system. These values should be adjusted where necessary to achieve consistency with available traffic counts and average traffic volumes on other systems. The vehicle-miles for each system requiring adjustment would then be recomputed by multiplying the new volume figures by the miles of road and by 365 days. Further adjustments by system may be required to achieve consistency in percentage of total and absolute vehicle-miles, percentage of rural and urban, and relationships in related data.

(FA-13)

(FA-15) Relationships, in which travel in a State is related to another item such as registrations, fuel consumption, or population, are affected by the proportion of travel by out-of-State vehicles compared to out-of-State travel by residents. So-called "bridge States," having high proportions of cross State traffic, may have comparatively high ratios. Large metropolitan concentrations near State borders may also affect these ratios, particularly where suburban residences predominate in one of the two States, and industry and commercial activities predominate in the other. Planning data available for these areas will provide a good indication of actual travel, but differential motor fuel purchase patterns--influenced by price, convenience, or tax policy--which can influence the computed miles per gallon rates in some States, cannot be determined from the usual transportation planning study data.

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(TAI-5) The entries for frontage road mileage (in parentheses) and traffic (not in parentheses) are on a different basis from those for toll and freeway mileage. The frontage road values should represent mileage that is in addition to that reported for any system in form PR-528 and related mileage tables. Entries should be shown in parentheses for mileage values in columns 1 and 2, but the corresponding travel values in columns 3-5 and accident data in columns 6-13 should not be in parentheses. Thus the travel for the system will include only mainline travel and not frontage road travel. By showing these frontage roads separately, it will be possible to determine their effect on accident rates, where they have not been specifically assigned to a highway system. Separate

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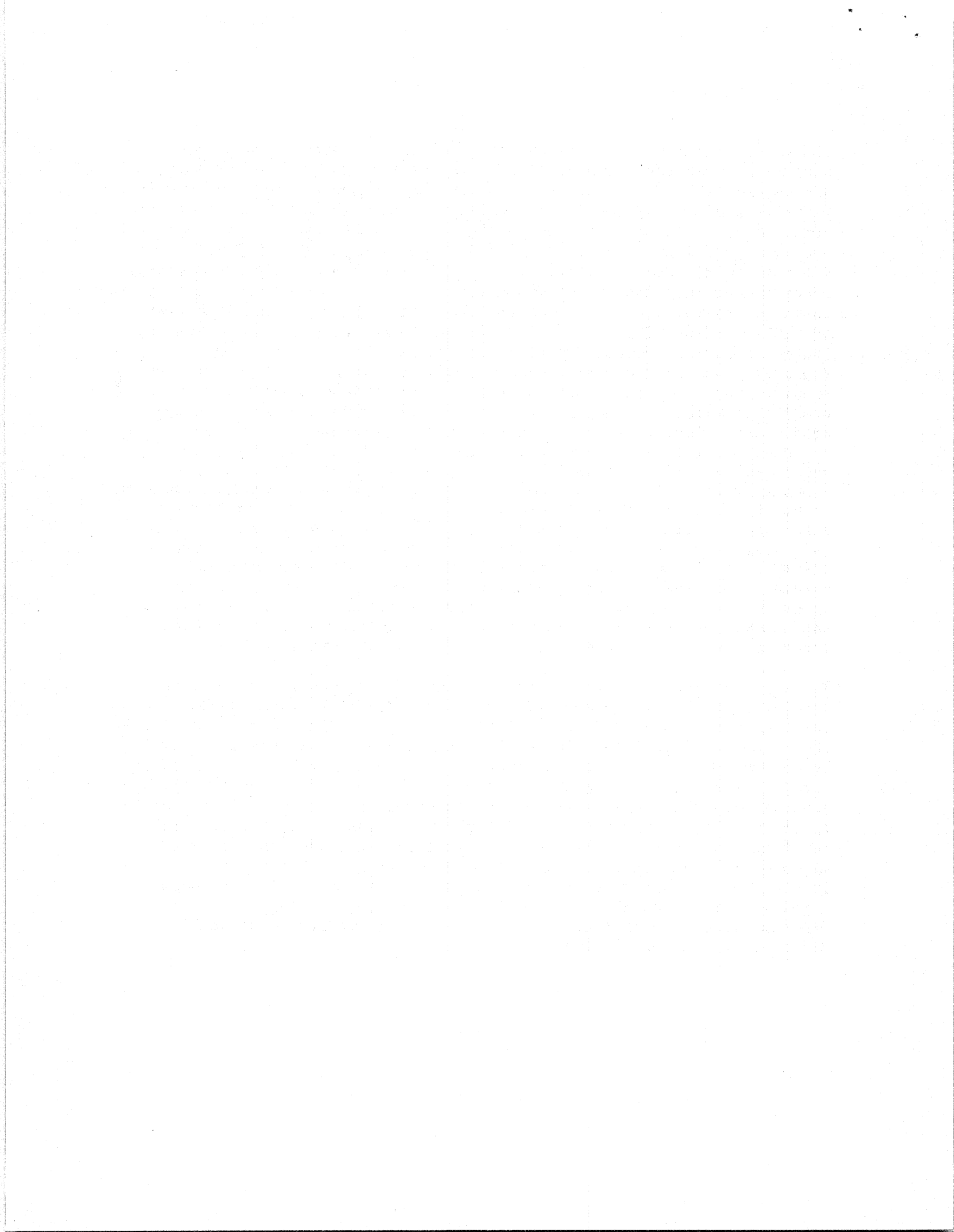


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frontage road entries should be shown only for frontage road mileage that is not reported as part of a system mileage entry. For example, in the sample table TA-1, page 13, the 9.9 miles shown as frontage road for Interstate urban (system 02) represents frontage roads within Interstate right-of-way that have not been assigned to another system. Similarly, the State total mileage of 74,293.1 does not include this 9.9 miles of frontage road. The 33 million vehicle-miles of travel on these frontage roads is not included in the 705 million shown for system 02, and it is added to the systems 01 and 02 entries to obtain the subtotal final Interstate of 1,554 = (816 + 705 + 33). A desirable practice, used in a number of States having Interstate frontage road mileage, is to assign these frontage roads to other systems, including the Federal-aid primary and secondary systems, and other State and local systems depending on the traffic service, continuity, and other system criteria. Any frontage road mileage that is included in such a system mileage figure should not be shown separately in parentheses, and no separate line entry for vehicle-miles or accidents is needed. The parenthetical values for frontage road mileage in column 1 will thus represent mileage in addition to the State total system mileage. On the other hand, the unparenthesized vehicle-mile values in column 3 and the accident values in columns 6-13 corresponding to the parenthetical frontage road mileage entry in column 1 should be included in the State vehicle-mile and accident totals. For example, the 33 million vehicle-miles on the 9.9 miles of frontage road is included in the 17,859 million total vehicle-miles for the State. Collector-distributors are not considered to be frontage roads and their traffic is counted as part of the mainline travel.

These procedures will assure that road mileage values in column 1 are consistent with mileage reported by highway system in form PR-528 and related forms and with data published in "Highway Statistics." Similarly, the State total vehicle-miles of travel and State total accidents will be accounted for with frontage road travel and accidents properly excluded from vehicle-miles on freeways. The accident rates on a per 100 million vehicle-mile basis will also be consistent and correct by this procedure. In column 5 the daily vehicle-miles per mile figures for the subtotal and total values calculated on this basis of excluding frontage road mileage, but including frontage road travel will be slightly but insignificantly higher than the true value. As the traffic patterns stabilize with completion of additional Interstate mileage, and these frontage roads are assigned to the appropriate system, these small differences will be eliminated.

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Reporting Fatal and Nonfatal Injury Accidents

Reportable accidents

(TAI-6) For consistency, it is desired that all accidents be reported which involve a "motor vehicle traffic accident injury" as discussed under sections 2, 4, 5, 6, and 7 of "Manual on Classification of Motor Vehicle Traffic Accidents," Highway Planning Program Manual, Volume 9, Chapter II, Appendix D. Motor vehicle traffic accidents which involve property damage, but do not involve injury, and motor vehicle accidents which do not meet the criteria of a motor vehicle traffic accident should be excluded from table TA-1. This is in accordance with usual procedures for reporting injury accidents related to highway usage. The proper identification and reporting of data for the two types of injury accidents (fatal and nonfatal) will require careful coordination with other agencies.

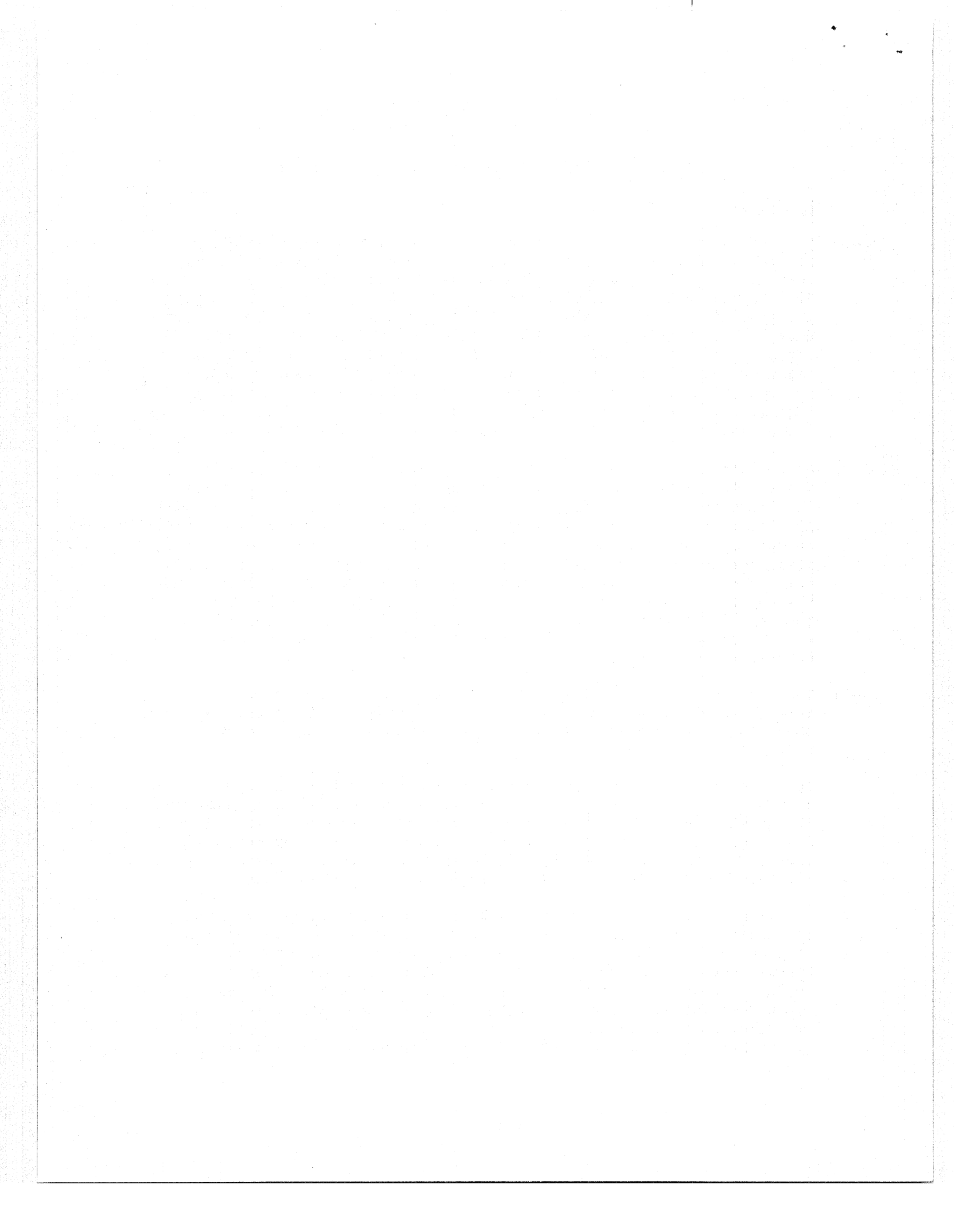
(TAI-2) As defined in section 7.2 of "Manual on Classification of Motor Vehicle Traffic Accidents," Highway Planning Program Manual, Volume 9, Chapter II, Appendix D, a "fatal injury is an injury that results in death within 12 months of the motor vehicle traffic accident." In a number of States, it appears that fatal accidents that result from a death several months after the accident are not adjusted back to the month of the accident. For the purposes of the table TA-1 report to the Bureau of Public Roads, the number of fatal accidents and fatalities should be based on a feasible cutoff date to allow compilation of the table by the due date in accordance with present State reporting procedures and practices for highway accident data.

(TAI-7) The numbers of fatal accidents for each highway category should be entered in column 6. The total number of fatalities which resulted from these fatal accidents should be entered for each highway category in column 8.

The number of motor vehicle traffic accidents resulting in injuries, but not fatal injuries, should be entered in column 10 by highway category. The total number of nonfatal injuries resulting from fatal and nonfatal injury accidents should be entered in column 12 by highway category. Thus the entries in column 12 will be the total number of persons injured, but not fatally injured, from both fatal and nonfatal accidents.

A commonly used method for comparing accident characteristics between categories is based on the exposure or "opportunity" as indicated by total travel for each category. For this purpose, the rate for each highway category and each category of accident and injury may be entered in each odd numbered column 7 through 13 if the State so desires. If the State does not wish to calculate these values, the columns should be provided, but left blank so that the values can be calculated and entered by the Washington office staff. These values should be calculated by

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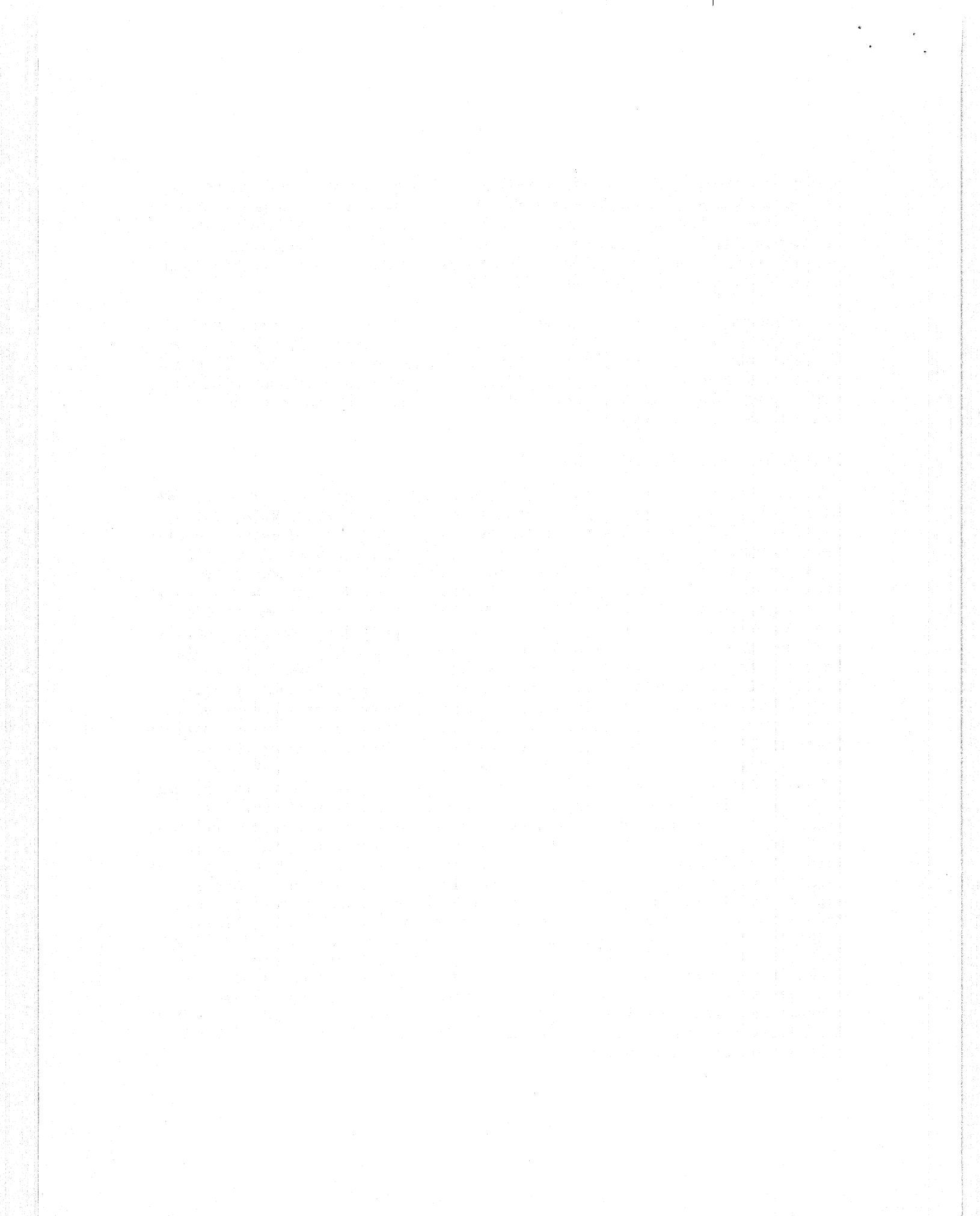
dividing the entry in the even numbered column beginning with column 6, by the annual vehicle-mile entry in column 3 for the same highway category. Then, since the vehicle-miles in column 3 are in millions, the resulting quotient should be multiplied by 100 and the resulting rate per 100 million vehicle-miles should be posted in the corresponding odd numbered column beginning with column 7.

The statewide rates in the lower part of the table may be calculated if the State so desires. If not, space should be provided so that they may be calculated and entered by the Washington office staff. The statewide rates should be calculated by dividing the appropriate column total for each even numbered column beginning with column 6, by the appropriate value under related data.

Fatal and nonfatal injury accidents

(TAI-6) The numbers of accidents, fatalities, and injuries should be reported in alternate columns beginning with column 6, and the corresponding rates on a 100 million vehicle-mile basis may be reported in succeeding alternate columns beginning with column 7. It is expected that nearly all States can provide reliable fatal and nonfatal injury accident data separately by rural and urban for the Interstate and Federal-aid primary system (systems 01, 02, 31, 32, 03, and 04). Most States can provide similar detail for Federal-aid secondary mileage under State jurisdiction and for other State system mileage (systems 05, 06, 09, and 10). Until improved reporting and system location procedures are worked out with many local jurisdictions, it appears that some States may not be able to report accident data separately by highway system for the Federal-aid secondary mileage under local jurisdiction or for local roads and streets (systems 07, 08, 11, and 12). Subtotals for certain combinations of these categories are generally available and should be shown to the greatest detail for which data can be developed. As shown in the example table TA-1, page 15, fatal accident values for all non-State rural were available, but could not be separated between Federal-aid secondary local rural (system 07) and local rural (system 11). Similarly, the example shows even less detail for nonfatal injury accidents. Where a relatively small number of fatal accidents are involved, it is desirable that a special effort be made to determine the highway system so that reliable values for each Federal-aid system can be provided. Where a reliable value for number of accidents cannot be determined, an entry of "NA" for "not available" should be shown. Where a small number of fatal or non-fatal injury accidents remain uncertain as to system, these should be assigned to a system on the basis of judgment using an appropriate average rate or prorating procedure. Where data are reported for each of the 12 basic systems, only the subtotal lines identified by an asterisk (*) in example table TA-1 need be provided.

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Highway system at intersections

(TAI-2) A problem requiring careful coordination with the accident investigation and reporting officials is the correct identification of the highway system to which an accident is attributed. Consistent established State practices should be followed where applicable. The criteria discussed below and illustrated by reference to figure 1 are intended to provide general guidance to facilitate consistency. They must, of course, be applied with judgment.

1. Within an intersection area involving more than one system, accidents should be attributed to the higher order or more important system. A restrictive definition of intersection area is preferred with the aim that only accidents resulting from conflict involving traffic on the higher system will be assigned to the higher system, while accidents related primarily to standards, geometrics, maintenance, driving practices, abutting land use, or other characteristics of the lower system, will be attributed to the lower system, even though a vehicle about to enter or just having departed from the intersection area may be involved. The intent is to attribute the accident to the highway system or facility providing the traffic service to the traffic from which the accident evolved. At an intersection, this is not necessarily related to the source of funds for construction or maintenance.

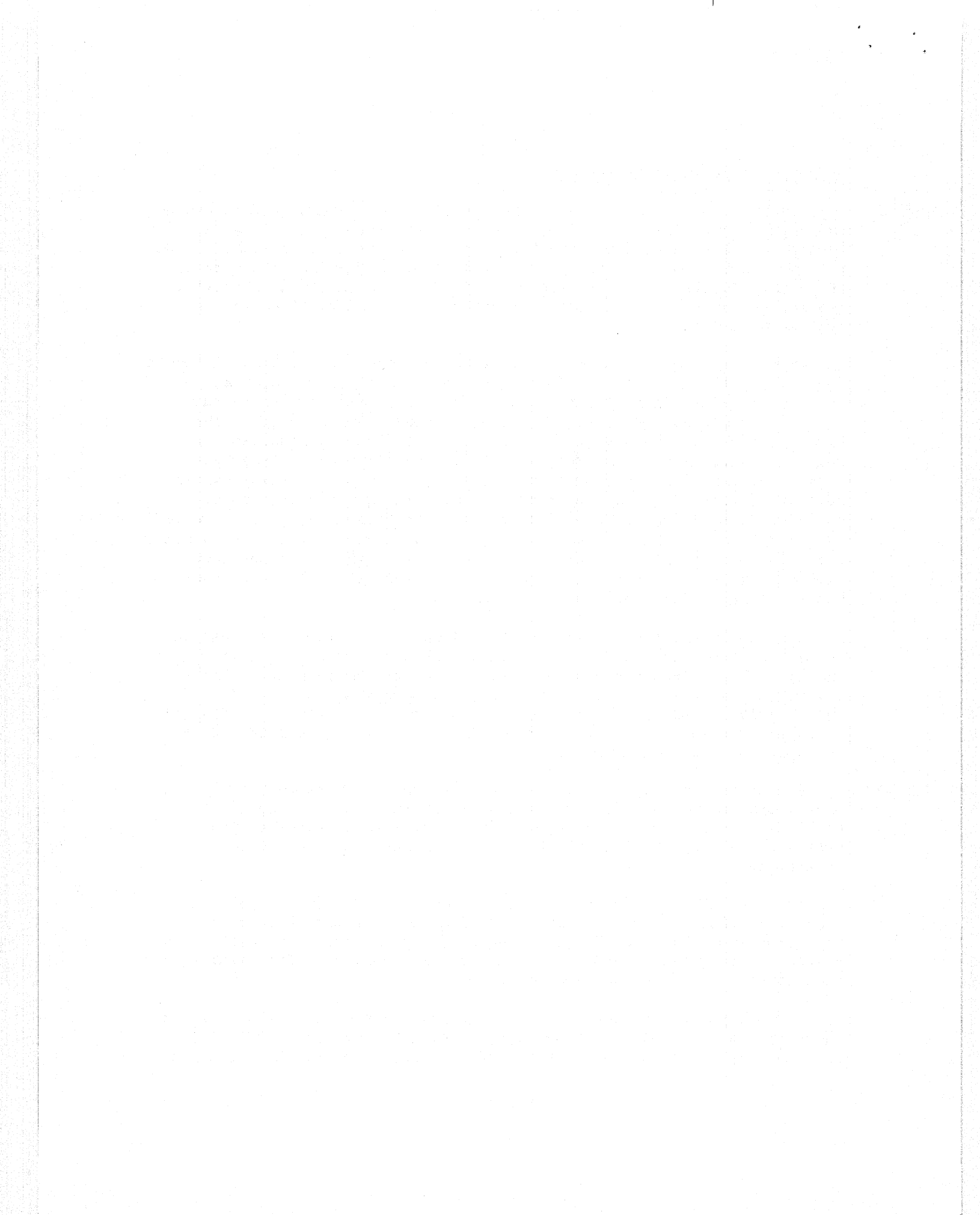
2. For the Interstate System and other freeways or expressways having separation structures or ramps, accidents should be considered within the interchange area and should be attributed to the freeway or expressway highway system if within a boundary not more than 100 feet from a ramp terminal measured from the gore of the on or off ramp. Painted or reflectorized separation lines ordinarily should not be considered as the gore for this measurement.

(TAI-3) 3. For an unchannelized-at-grade intersection, the intersection is the area within a boundary 20 feet beyond crosswalk marking, stop line markings, and stop or yield signs. Where these indications are not present, the projection of right-of-way or fence lines should be used as a guide.

4. At channelized intersections, the gore of islands or the point at which full width is provided in a turn lane or slot may serve as a criterion from which the 20-foot boundary is measured. The location of advance warning signs should generally be disregarded in determining the limits of the intersection area.

5. For the purpose of identifying the highway system for intersections where spacing is closer than 40 feet between intersection boundaries, the boundary should not usually extend more than one-half the distance

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to the next intersection or ramp terminal. At complex intersections where roads or streets merge or diverge a short distance from an additional crossing, it is often desirable to identify two separate intersections.

Highway system for grade separations

Where an accident occurs on an overcrossing or undercrossing without ramp connections between the facilities, the accident should be attributed to the highway system of the road on which it occurs. Where a vehicle, a vehicle occupant, or a pedestrian originally on one system leaves that facility as a result of the accident or action immediately prior to the accident, and a person is killed or injured on the other highway, then the accident should ordinarily be attributed to the system on which the vehicle was originally traveling.

Highway system for frontage road

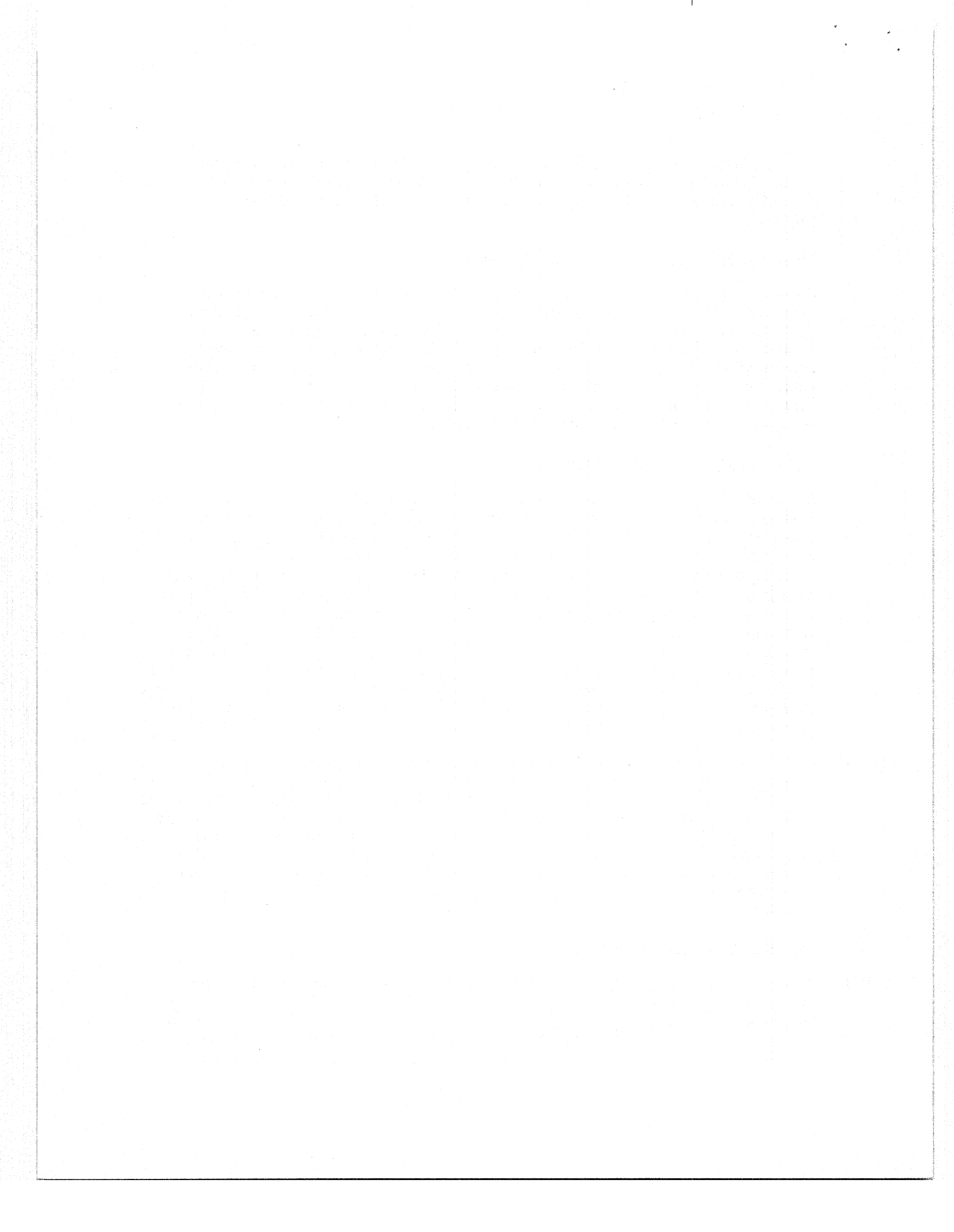
Any accident occurring on a ramp or within 100 feet from the terminal of a ramp connecting a frontage or service road with the main traveled lanes or with a fully access controlled collector-distributor road should be attributed to the higher order system. Accidents occurring elsewhere on frontage roads or service roads should be attributed to the highway category of which the frontage or service road is a part if reported on form PR-528 and related reports. For frontage roads or service roads that are not reported as system mileage in form PR-528, the accident should be reported and included in a separate line entry for "frontage road," as indicated by a parenthetical mileage entry in column 1 of table TA-1. Frontage road mileage should not be reported as Interstate mileage on form PR-528 and related tables. The reporting of system mileage is discussed in detail under "Summarization of Data, Mileage and traffic data."

- (TAI-4) Collector-distributor roads within the right-of-way and having full control of access should be considered as part of the freeway. On certain freeways, usually with more than three lanes in one direction, additional lanes are often separated by barriers from the three or more high speed lanes, so that traffic entering and leaving at ramps may be prevented from immediately crossing to or from the main high speed lanes. Since these collector-distributor lanes or roadways are between the on- and off-ramps and the main high speed lanes they are considered a part of the freeway.

Example system determinations

- (CM-3) Figure 1 has been prepared to aid in clarifying the method of reporting accidents by highway system in interchange and intersection areas. In the example, a freeway, in this case a rural Interstate highway, system 01, crosses over and interchanges with a highway on the rural Federal-aid primary system, code 03. The interchange area extends 100 feet south of

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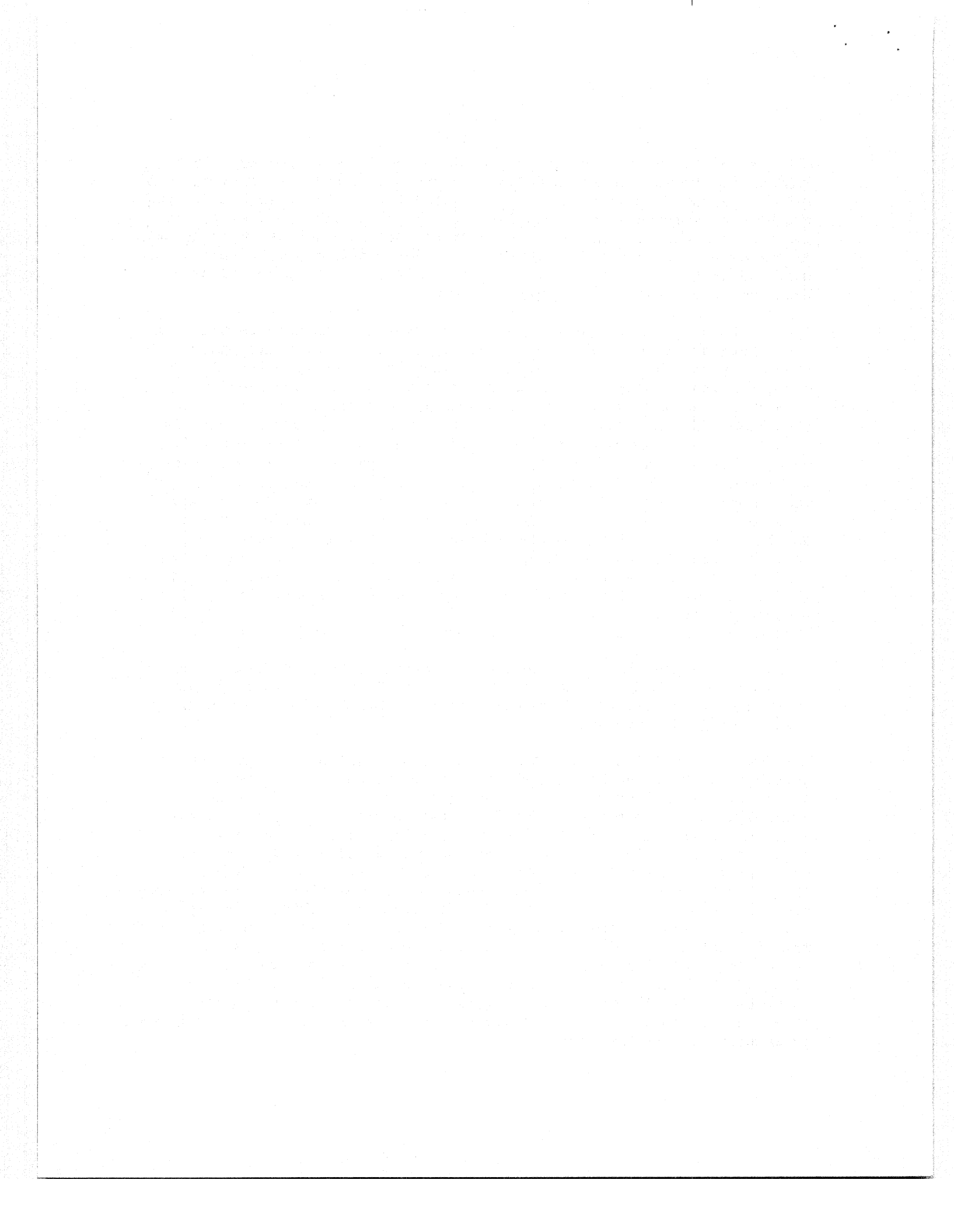
the gore of the ramp from the crossroad to the freeway. On the north side of the freeway where there is no gore, the interchange area extends 100 feet north from the end of the curb return. Any accidents occurring within the interchange area should be attributable to the freeway. As shown in the sketch, all ramps and part of the crossroad which is actually on system 03, but within the boundaries, are considered to be part of the interchange area. Thus, any accidents occurring in the unshaded area would be attributable to highway system 01.

(CM-3) Just north of the interchange area in the sketch is an intersection. A rural highway on the Federal-aid secondary system under State control, code 05, forms the east leg, while the west leg is on the Federal-aid secondary system under local control, code 07. On the east leg, there is a stop line and the intersection area is measured 20 feet east from this line. On the west, there is a local rural road, code 11, entering so close to the intersection that there is less than 40 feet--in this case 32 feet--from the crosswalk line. Therefore, the intersection area is extended only half the distance between intersections, or 16 feet in this example. Thus, any accidents occurring in the cross hatched area will be attributed to system 03, those to the east to highway system 05, and those to the west to highway system 07. On the local road, code 11, it is assumed that no crosswalk line or other indication of the intersection area was available. In this case, a logical crosswalk location was assumed and 20 feet was measured back from this point. Thus, all accidents occurring to the southeast of this line would be attributed to highway system 07, and those to the northwest to highway system 11.

If in the example, there was no ramp connection between systems 01 and 03, then any accidents occurring on the north-south crossroad would be attributed to system 03 as explained in the instructions under "Highway system for grade separations."

The detailed definition of intersection area is intended to provide guidance in establishing consistent interpretation since there is no nationally recognized standard at present. The 100 foot distance criterion is consistent with the Interstate accident study and represents approximately 5 car lengths or a little more than the length of a semitrailer combination. At a crossroad speed of 30 miles per hour, most drivers could not react and make a panic stop in this distance. The 20 foot criterion for the intersections is equivalent to approximately one car length and is the recommended distance for parking prohibition from a crosswalk as shown in figure 2-10 of the "Manual on Uniform Traffic Control Devices." While there is some difference of opinion concerning desirable limits, it is generally agreed that for the majority of accidents occurring within these boundaries, the intersection or interchange traffic conditions, signing, layout, turning movements or other related characteristics contributed in some degree to the occurrence or severity of the accident.

(more)



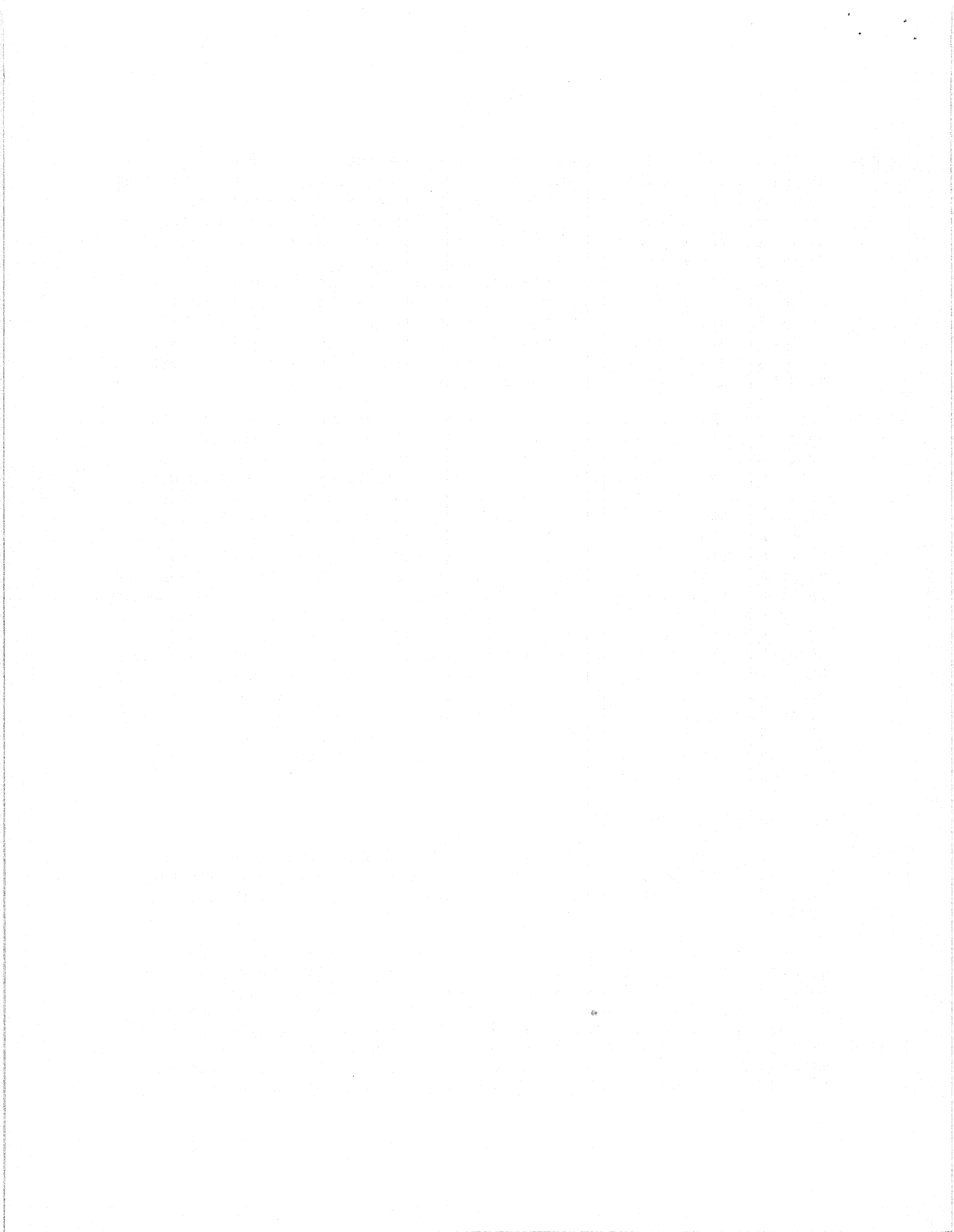
- (CM-3) In States where each accident report does not show the accident location in sufficient detail, or where all reports are not readily available, it will not be possible to provide this breakdown in every case. On the other hand, the number of intersection accidents, which are questionable as to proper highway system, will be few in number in most States. Where feasible in the time available, it is desirable that these cases be checked, particularly if a fatality is involved. Similarly, where criteria used by the police or other accident investigating authority use a definition of intersection area or assignable highway, which is different but reasonably consistent with these criteria, these data are acceptable for table TA-1. In any case, every accident should be assigned to a highway system or subtotal category.
- (CM-4) Accidents which occur on a section of new Interstate mileage which is opened to traffic during the year should, of course, be reported as occurring on the completed Interstate System. Accidents occurring on parallel traveled-way mileage either before or after the new Interstate section was opened to traffic should be reported as occurring on the highway system of which the traveled-way section is a part. Vehicle-miles for Interstate sections opened during the year should agree with that reported for the Interstate System Traveled-way Traffic Map in accordance with IM 50-8-66. The vehicle-miles for the older traveled-way section should be calculated for the number of days of the year it served Interstate travel. Likewise, the vehicle-miles for the new section during its service should be computed and added to the first value to obtain total annual vehicle-miles for the new section. This will assure that accidents are reported for the highway system on which they occurred, but the vehicle-miles for the completed Interstate System will be overstated by a slight amount (less than 1/2 percent) while vehicle-miles for the other Federal-aid primary will be slightly understated. The vehicle-mile subtotal for completed Interstate and traveled-way, combined will be correct.

Use of the accident data

- (TAI-7) It is expected that most States will wish to calculate all rates for their own information. In addition, a review of the rates to locate extreme values will provide a general check and may reveal mathematical errors.

- Where rates in certain categories are based on a small number of accidents or injuries, extreme values may result. In such cases, these extremes may be of little significance. On the other hand, where such extremes are based on a reasonably large number of accidents, about 25 or more, or where they are consistently extreme for 2 or more previous years, then where a high rate is indicated, special attention may be warranted. As with other planning reports and tabulations, table TA-1 should be reviewed by a person experienced in the application of traffic
- (TAI-8)

(more)

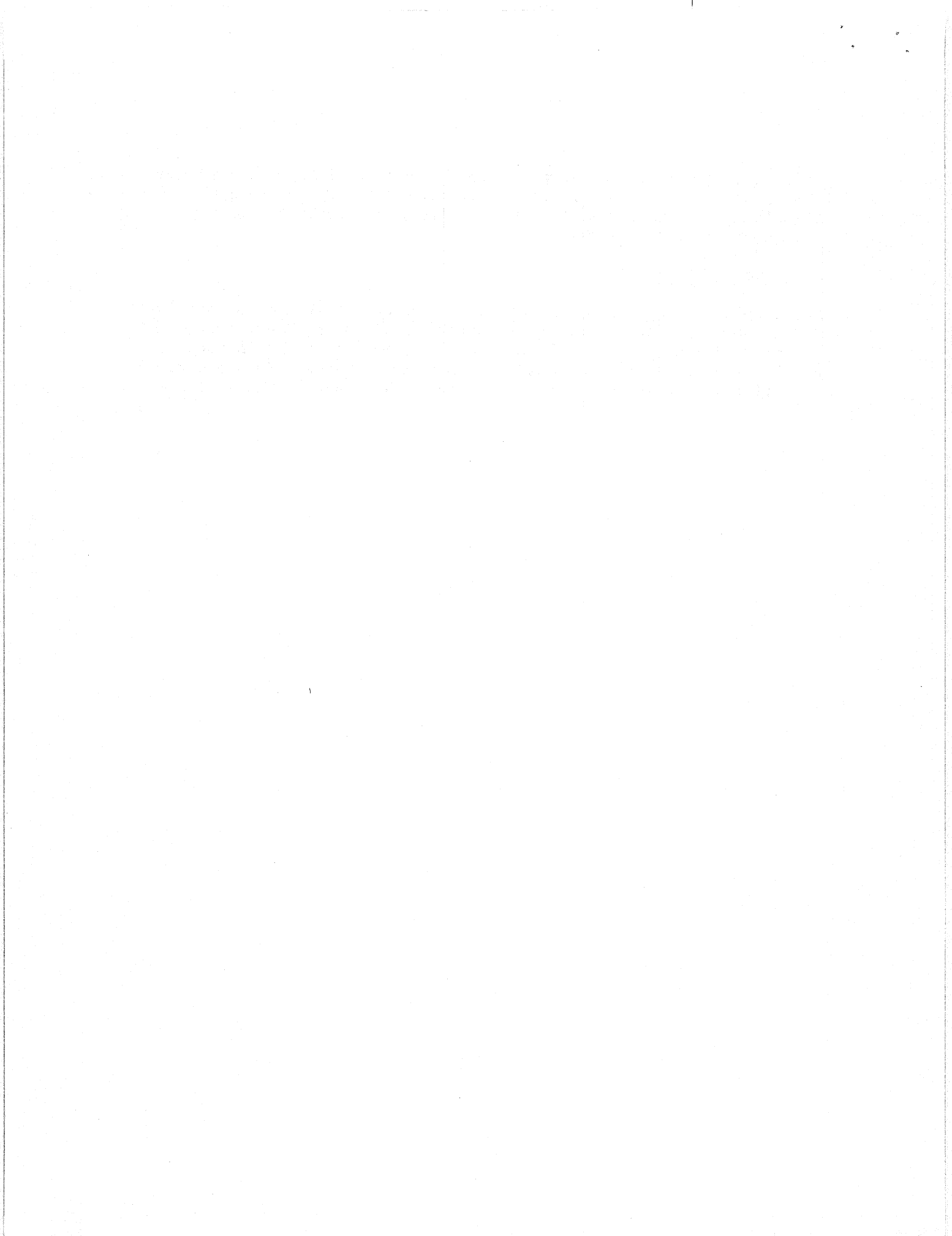


and accident data to planning and administrative problems for extreme values, significant relationships, and annual trends and changes. The significant points should then be brought to the attention of top management in usable form.

Submittal of table TA-1

The completed table TA-1, prepared in accordance with the instructions, should be submitted to the Current Planning Division, 38-26, Office of Planning, Bureau of Public Roads, 1717 H Street, NW., Washington, D.C., 20591, by April 1 the year following the year for which data are reported, using procedures established by the division and regional offices.

(more)



- 15 -
State of (EXAMPLE)

Prepared (March 28, 1968)
date

Table TA-1 - Statewide mileage, travel, and nonfatal and fatal injury accidents, 1966 (example)

Highway system and related items	1966 road mileage and travel					Fatal accidents				Nonfatal injury accidents		All non-fatal injuries from fatal and non-fatal accidents	
	Roads and streets in service		Annual vehicle-miles		Travels per vehicle-mile	Accidents		Fatalities		Nonfatal injury accidents		All non-fatal injuries from fatal and non-fatal accidents	
	Miles	Percent	Millions	Percent	V.P.P.	Number	Per 10 ⁴ V-M	Number	Per 10 ⁴ V-M	Number	Per 10 ⁴ V-M	Number	Per 10 ⁴ V-M
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
01 Interstate, rural, final (Total)	303.0 (37.6)	0.41 (0.05)	816 (137)	4.57 (0.77)	7,378 (9,983)	14 (4)	1.94 (2.92)	25 (46)	3.01 (4.38)	176 (42)	21.6 (30.7)	387 (83)	47.4 (60.6)
02 Interstate, urban, final (Frontage road)	66.5 (9.9)	0.09 (0.01)	705 (33)	3.95 (0.18)	29,046 (9,152)	17 (2)	1.70 (3.03)	14 (3)	1.89 (4.03)	244 (47)	34.6 (142.4)	462 (78)	65.5 (236.4)
Subtotal final interstate*	369.5	0.50	1,521	8.52	11,522	31	3.64	39	5.27	420	56.2	849	112.9
03 Traveled-way interstate, rural	398.3	0.53	743	4.16	5,111	45	6.06	64	8.62	1,211	163.0	2,047	275.5
04 Traveled-way interstate, urban	68.7	0.09	573	3.21	22,851	73	4.01	97	4.71	1,103	192.5	1,890	331.2
Subtotal traveled-way interstate	467.0	0.62	1,316	7.37	7,772	68	5.17	91	6.91	2,314	175.8	3,935	599.8
Subtotal final and traveled interstate rural	701.3	0.94	1,559	8.73	6,990	61	3.91	89	5.71	1,387	89.0	2,434	156.1
Subtotal final and traveled interstate urban	135.2	0.18	1,311	7.34	26,566	36	2.75	42	3.70	1,394	106.3	2,438	186.0
Subtotal final and traveled interstate	836.5	1.12	2,870	16.07	2,400	97	3.28	131	4.56	2,781	96.9	4,872	169.0
05 Other FAP, rural	3,810.3	5.14	3,679	20.32	2,604	211	5.81	281	7.75	3,895	110.1	6,328	174.4
06 Other FAP, urban (Full control of access)	399.9	0.53	1,941	10.87	13,575	70	3.61	80	4.22	2,740	141.6	4,466	230.1
Subtotal other FAP	4,210.2	5.67	5,620	31.19	3,604	281	5.04	361	6.32	6,635	121.1	10,794	193.8
Subtotal other FAP and traveled interstate rural	4,210.2	5.67	5,620	31.19	3,604	281	5.04	361	6.32	6,635	121.1	10,794	193.8
Subtotal other FAP and traveled interstate urban	4,210.2	5.67	5,620	31.19	3,604	281	5.04	361	6.32	6,635	121.1	10,794	193.8
Subtotal other FAP and traveled interstate	4,210.2	5.67	5,620	31.19	3,604	281	5.04	361	6.32	6,635	121.1	10,794	193.8
Subtotal all FAP rural*	3,810.3	5.14	3,679	20.32	2,604	211	5.81	281	7.75	3,895	110.1	6,328	174.4
Subtotal all FAP urban*	399.9	0.53	1,941	10.87	13,575	70	3.61	80	4.22	2,740	141.6	4,466	230.1
Subtotal all FAP*	4,210.2	5.67	5,620	31.19	3,604	281	5.04	361	6.32	6,635	121.1	10,794	193.8
07 FAS, State, rural	5,074.4	6.76	1,527	8.52	830	92	6.04	115	7.55	1,272	93.4	2,378	156.2
08 FAS, State, urban	157.0	0.21	408	2.28	7,170	12	2.94	11	3.19	52	17.9	816	200.0
Subtotal FAS State	5,231.4	6.97	1,935	10.80	1,001	104	5.39	126	6.63	1,324	100.7	3,194	165.5
09 FAS, local, rural	7,186.0	9.57	921	5.17	352	NA	NA	NA	NA	NA	NA	NA	NA
10 FAS, local, urban	211.7	0.29	389	1.95	4,474	13	3.72	15	4.30	NA	NA	NA	NA
Subtotal FAS local	7,397.7	9.86	1,310	7.12	471	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal FAS rural*	12,210.4	16.43	2,445	13.69	540	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal FAS urban*	370.7	0.50	757	4.23	5,595	25	3.30	24	3.70	NA	NA	NA	NA
Subtotal FAS*	12,581.1	16.93	3,202	17.92	607	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal FA, rural	16,730.0	22.52	7,633	42.74	1,250	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal FA, urban	898.4	1.21	4,099	22.44	12,270	13	3.27	152	3.79	NA	NA	NA	NA
Subtotal FA*	17,628.4	23.73	11,732	65.18	1,263	NA	NA	NA	NA	NA	NA	NA	NA
09 Other State rural	1,450.0	1.95	370	1.79	604	20	6.25	25	7.81	336	105.0	527	164.7
10 Other State urban	204.6	0.28	371	2.08	4,960	12	3.23	14	3.77	435	117.3	706	190.3
Subtotal all State rural	1,654.6	2.23	741	3.77	1,164	32	4.63	39	5.64	771	111.6	1,233	178.4
Subtotal all State urban	10,924.9	14.79	7,030	39.26	1,752	304	5.46	110	7.25	7,180	101.6	11,667	186.0
Subtotal all State*	12,579.5	17.02	14,771	78.52	2,916	336	5.23	149	6.75	7,959	126.9	12,900	200.0
Subtotal all State*	11,128.6	15.29	13,031	61.23	2,300	314	4.65	134	5.28	7,223	110.7	10,093	161.7
11 Local rural	41,507.3	55.72	1,659	4.15	96	NA	NA	NA	NA	NA	NA	NA	NA
12 Local urban or municipal (Full control of access)	8,411.5	11.37	1,077	21.83	1,269	122	3.13	137	3.52	NA	NA	NA	NA
Subtotal local	55,900.0	74.04	2,736	30.25	275	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal non-State rural	53,773.1	72.39	2,552	14.29	130	151	5.92	177	6.94	2,153	84.4	3,325	130.3
Subtotal non-State urban	8,625.2	11.61	1,266	23.74	1,349	135	3.18	152	3.58	8,840	208.2	12,566	296.4
Subtotal non-State*	62,398.3	83.00	3,818	38.07	264	266	4.21	329	4.84	10,993	161.7	15,911	234.1
Subtotal non-FA rural	48,048.2	64.67	1,949	10.91	111	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal non-FA urban	8,516.1	11.60	1,260	23.91	1,357	134	3.14	151	3.54	NA	NA	NA	NA
Subtotal non-FA*	56,564.3	76.27	3,209	34.82	301	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal rural*	64,778.2	87.19	2,587	93.65	405	535	5.58	687	7.17	9,293	97.0	14,992	156.3
Subtotal urban*	9,514.9	12.81	1,277	4.57	17,378	(16)	1.96	(25)	3.06	(176)	21.6	(387)	47.4
Subtotal*	74,293.1	100.00	3,864	98.22	3,823	569	6.54	712	6.66	13,939	168.4	21,017	233.9
Total (Full control of access)*	74,293.1	100.00	3,864	98.22	3,823	569	6.54	712	6.66	13,939	168.4	21,017	233.9
Total (Full control of access)*	427.1	0.58	1,946	10.90	12,483	(37)	1.70	(50)	2.57	(577)	29.7	(1,156)	99.4

Related data for 1966

Rates

Vehicles registered, thousands	1,851	Per 100 million vehicle-miles	4.48	5.54	130.1	201.6
Annual miles per vehicle	9,648					
Motor fuel, million gallons	1,436	Per thousand vehicles	0.43	0.535	12.55	19.45
Gallons per vehicle	776					
Miles traveled per gallon	12.44					
Population, thousands	3,950	Per thousand population	0.203	0.251	5.88	9.11
Licensed drivers, thousands	7,029					
Licensed drivers, percent population	51.11					
Persons per vehicle	2.13					
Licensed drivers per vehicle	1.09					
Annual travel per capita, miles	4,521	Per thousand licensed drivers	0.396	0.490	11.51	17.83
Travel per licensed driver, miles	8,045					

* Subtotals indicated by an asterisk should be shown in all cases. Other subtotals need be calculated where accident data are not available for each of the basic 17 coded highway systems and the subtotal includes the missing highway system.

Example prepared by:
Current Planning Division
Planning Services Branch
September 21, 1966
Revised December 28, 1967

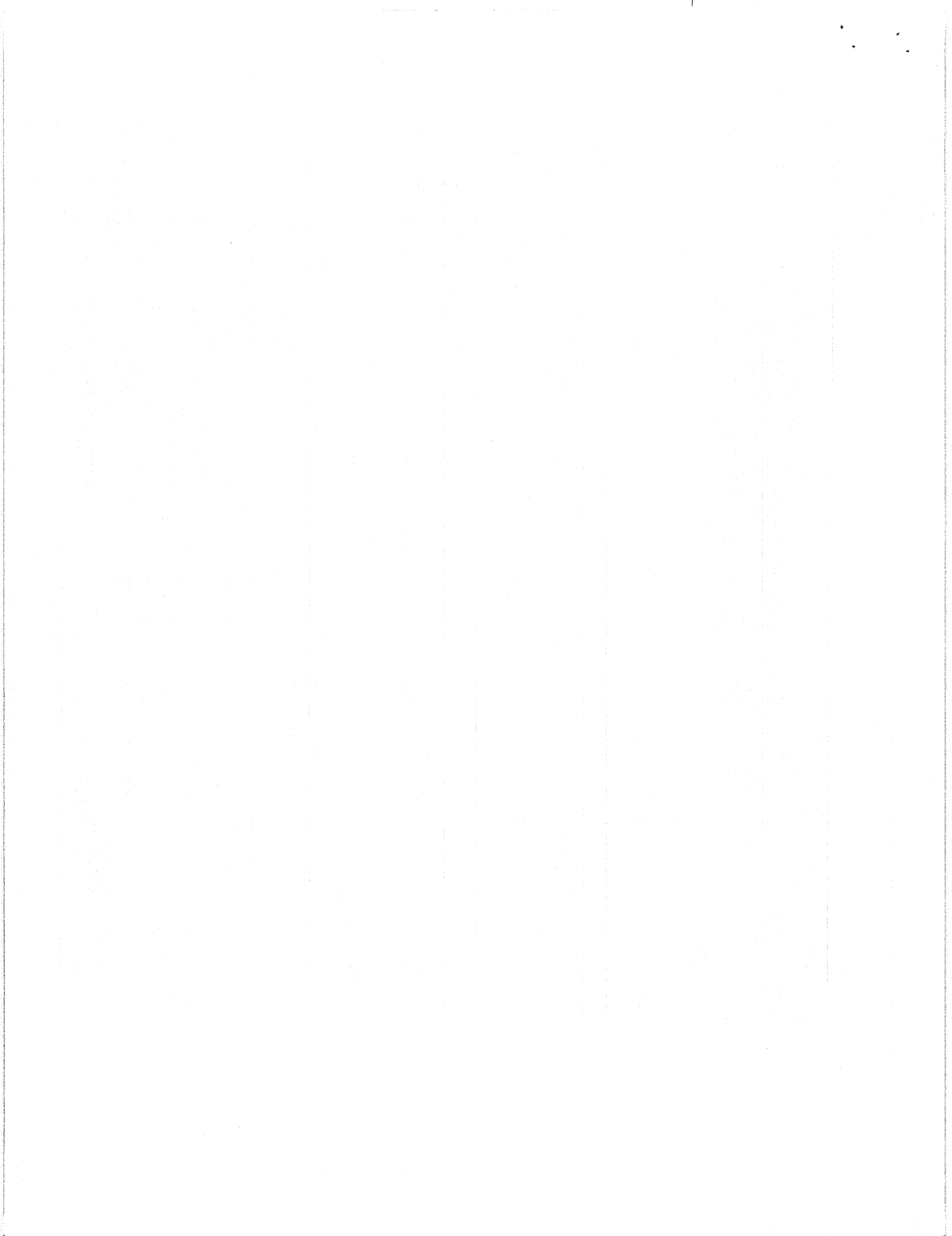


Table A -- Definitions and codes for highway systems and the relationship to mileage reported in form PR-528

(IM 50-1-68)

Highway system descriptions and codes

Code	Description
01	Interstate, rural, final location
02	Interstate, urban, final location
03	Other FA primary, rural
04	Other FA primary, urban
05	FA secondary rural, State jurisdiction
06	FA secondary urban, State jurisdiction
07	FA secondary rural, local jurisdiction
08	FA secondary urban, local jurisdiction
09	Other State highways, rural
10	Other State highways, urban
11	Other rural roads
12	Other city streets
31	Interstate, rural, present location
32	Interstate, urban, present location

1/ The coding for toll roads is as follows: For toll roads on which trucks are permitted, add 20 to the appropriate system code above. For example, code 24 would be a toll facility on the Federal-aid primary urban system, not Interstate. For toll parkways where trucks are prohibited, 60 should be added to the appropriate system code. For the Interstate System, codes 01 and 02 should be used where the mileage is on final location, and in status groups 1 or 6 as defined in PPM 10-6. Where the traveled-way does not meet these standards, it should be coded 31 or 32. In some cases, this type mileage may actually be on a system other than the Federal-aid primary system.

Relationship of each highway system to mileage reported in form PR-528

Budget Bureau No. 41-R1765.1

FORM PR-528 (REV. 12-67)		U.S. DEPARTMENT OF COMMERCE BUREAU OF PUBLIC ROADS						STATE	
SUMMARY OF EXISTING STATE AND LOCAL ROADS AND STREETS (SEGREGATED ACCORDING TO FEDERAL-AID AND NON-FEDERAL-AID SYSTEM MILEAGE) ¹								AS OF DECEMBER 31, 19 _____	
LINE NO.	ROAD SYSTEM	INTERSTATE SYSTEM ²		TOTAL FEDERAL-AID PRIMARY HIGHWAY SYSTEM ³		FEDERAL-AID SECONDARY HIGHWAY SYSTEM		NOT ON FEDERAL-AID SYSTEMS (7)	TOTAL (Column 2 thru 7)
		RURAL (1)	URBAN (2)	RURAL (3)	URBAN (4)	RURAL (5)	URBAN (6)		
1	STATE PRIMARY HIGHWAY SYSTEM			01, 31 & 03	02, 32 & 04	05	06	09	
	a. RURAL	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	09	
	b. MUNICIPAL - \$,000 AND OVER	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	10	
	c. MUNICIPAL - UNDER \$,000	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	10	
2	STATE SECONDARY HIGHWAY SYSTEM			01, 31 & 03	02, 32 & 04	05	06	09	
	a. RURAL	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	09	
	b. MUNICIPAL - \$,000 AND OVER	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	10	
	c. MUNICIPAL - UNDER \$,000	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05	06	10	
3	LOCAL ROADS UNDER STATE CONTROL			01, 31 & 03	02, 32 & 04	07	08	11	
	a. RURAL	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	11	
	b. MUNICIPAL - \$,000 AND OVER	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	12	
	c. MUNICIPAL - UNDER \$,000	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	12	
4	COUNTY ROADS			01, 31 & 03	02, 32 & 04	07	08	11 & 12	
5	TOWN AND TOWNSHIP ROADS			01, 31 & 03	02, 32 & 04	07	08	11 & 12	
6	LOCAL CITY STREETS			01, 31 & 03	02, 32 & 04	07	08	12	
7	ROADS NOT OVERLAPPING STATE, COUNTY, OR OTHER LOCAL SYSTEMS CLASSIFIED ABOVE			01, 31 & 03	02, 32 & 04	07	08	9, 10	
	a. STATE PARK, FOREST, AND RESERVATION ROADS	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	11 & 12	
	b. NATIONAL PARK, FOREST, AND RESERVATION ROADS	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	11 & 12	
	c. TOLL ROADS	01 & 31 (Toll 21)	02 & 32 (Toll 22)	01, 31 & 03 (Toll 23)	02, 32 & 04 (Toll 24)	07 (Toll 27)	08 (Toll 28)	09, 10, 11 & 12 (Toll 29, 30 but not 31 & 32)	
	d. OTHER ROADS	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	07	08	11 & 12	
8	TOTAL EXISTING MILEAGE	01 & 31	02 & 32	01, 31 & 03	02, 32 & 04	05 & 07	06 & 08	09, 10, 11 & 12	

¹ This form does not include proposed or projected route mileage. The entries in Federal-aid columns include only the mileages that have as the "travelled way" for each Federal-aid system. Interstate system mileages reported separately in columns 1 and 2 are also in the total Federal-aid primary system mileages in columns 3 and 4 and to that extent are properly included in two places on this form.

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE: 1969 O-350-001

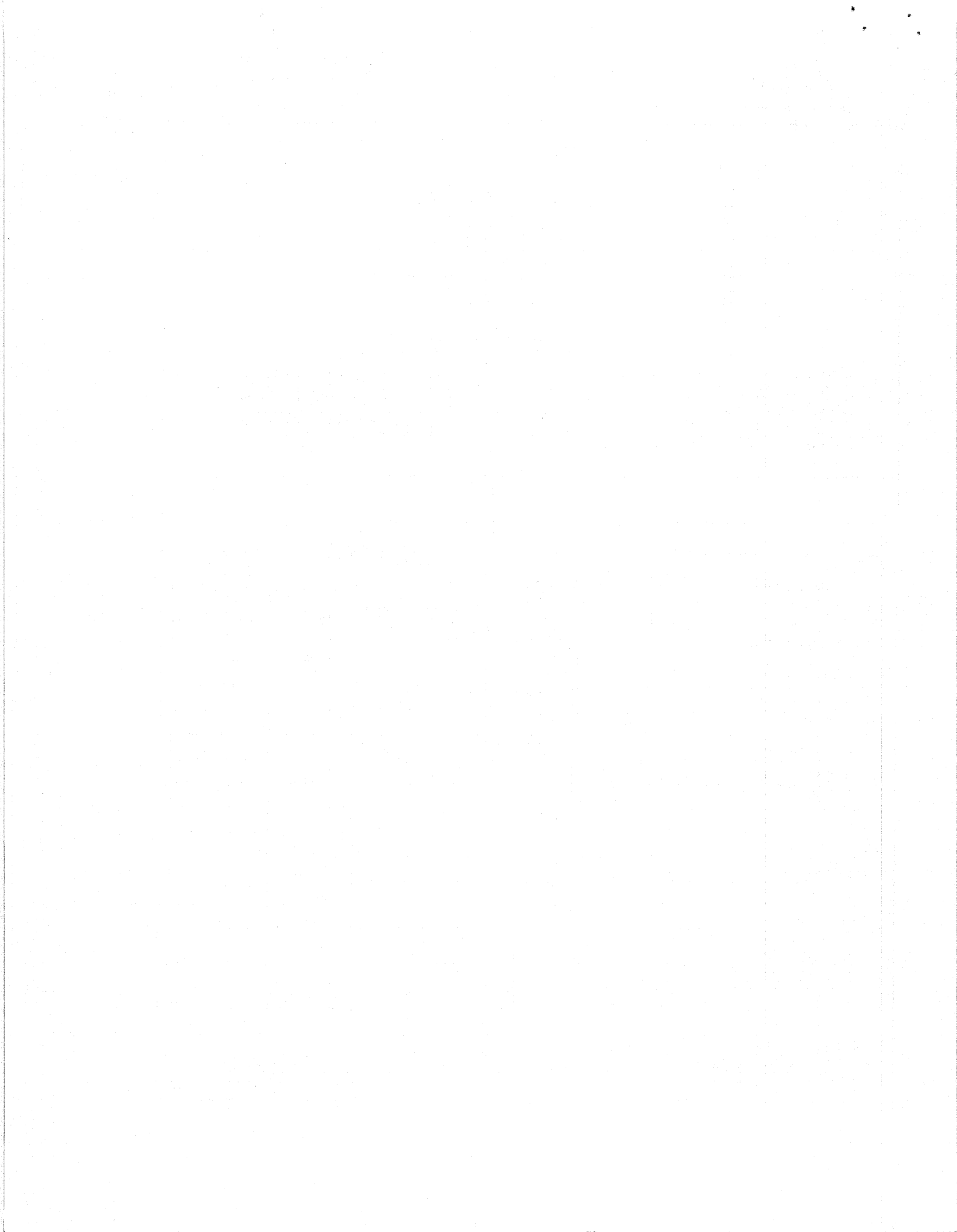
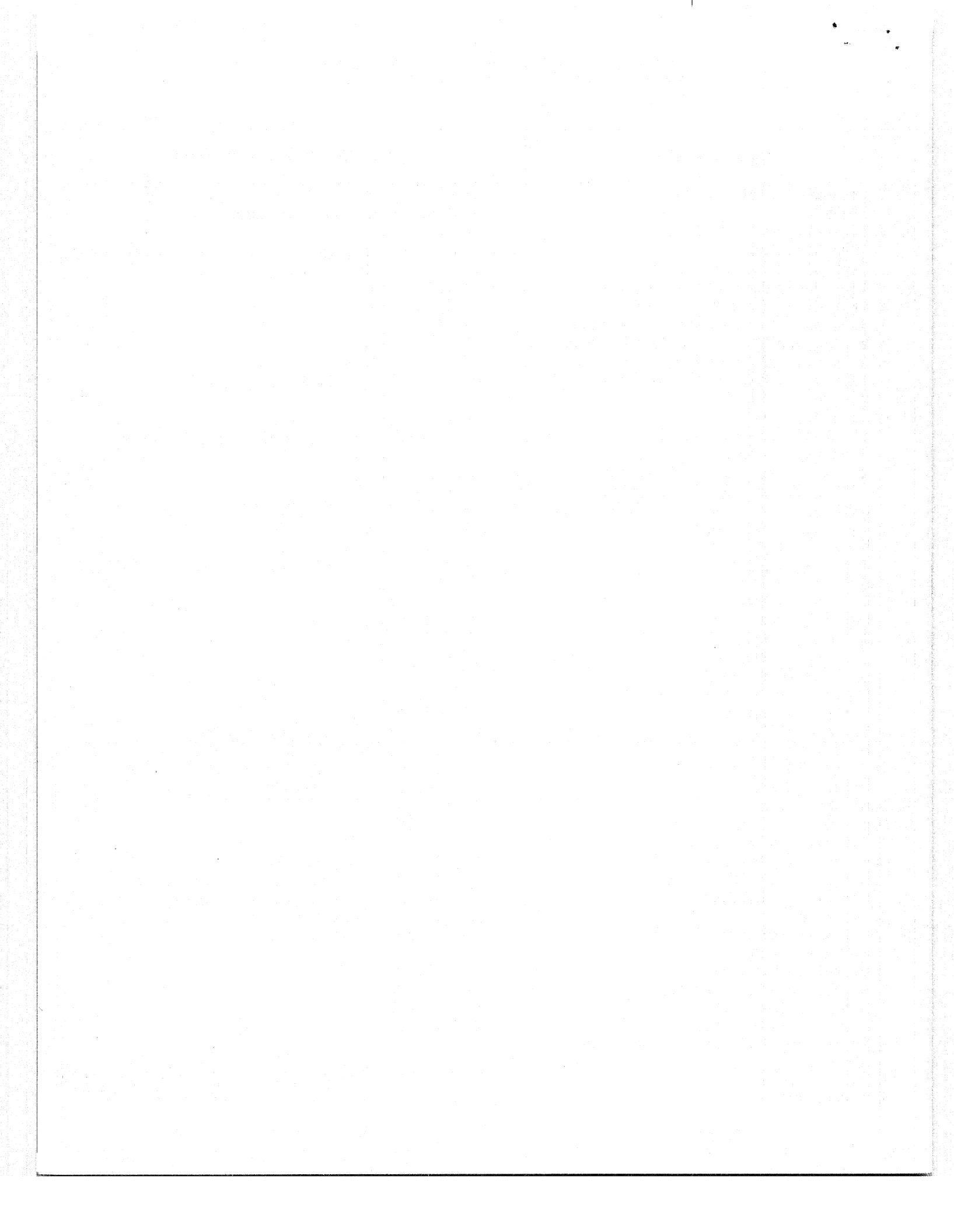


Table B -- Relationship between highway system subtotals and highway system codes

Highway system	Code for highway systems
01 Interstate, rural, final (Toll) 02 Interstate, urban, final (Frontage road) Subtotal final Interstate	01 21 (Values included in line above) 02 (22 toll) Not coded (Mileage excluded from all other entries) 01, 02, 21, 22
31 Traveled-way Interstate, rural 32 Traveled-way Interstate, urban Subtotal traveled-way Interstate Subtotal final and traveled IS rural Subtotal final and traveled IS urban Subtotal final and traveled IS	31 (51 toll) 32 (52 toll) 31, 32, 51, 52 01, (21), 31, 51 02, (22), 32, 52 01, 02, 21, 22, 31, 32, 51, 52
03 Other FAP, rural 04 Other FAP, urban (Full control of access) Subtotal Other FAP Subtotal Other FAP and traveled IS, rural Subtotal Other FAP and traveled IS, urban Subtotal Other FAP and traveled IS Subtotal all FAP rural Subtotal all FAP urban Subtotal all FAP	03 (23 toll) 04 (24 toll) Not coded (Values included in line above) 03, 04, 23, 24 03, 23, 31, 51 04, 24, 32, 52 03, 04, 23, 24, 31, 32, 51, 52 01, 03, 21, 23, 31, 51 02, 04, 22, 24, 32, 52 01, 02, 03, 04, 21, 22, 23, 24, 31, 32, 51, 52
05 FAS State, rural 06 FAS State, urban Subtotal FAS State 07 FAS, local, rural 08 FAS, local, urban Subtotal FAS local Subtotal FAS rural Subtotal FAS urban Subtotal FAS	05 (25 toll) 06 (26 toll) 05, 06, 25, 26 07 (27 toll) 08 (28 toll) 07, 08, 27, 28 05, 07, 25, 27 06, 08, 26, 28 05, 06, 07, 08, 25, 26, 27, 28
Subtotal FA rural Subtotal FA urban Subtotal FA	01, 03, 05, 07, 21, 23, 25, 27, 31, 51 02, 04, 06, 08, 22, 24, 26, 28, 32, 52 Sum of two lines immediately above
09 Other State, rural 10 Other State, urban Subtotal other State Subtotal all State rural Subtotal all State urban Subtotal all State	09 (29 toll) 10 (30 toll) 09, 10, 29, 30 01, 03, 05, 09, 21, 23, 25, 29, 31, 51 02, 04, 06, 10, 22, 24, 26, 30, 32, 52 Sum of two lines immediately above
11 Local rural 12 Local urban or municipal Subtotal local Subtotal non-State rural Subtotal non-State urban Subtotal non-State Subtotal non-FA rural Subtotal non-FA urban or municipal Subtotal non-FA	11 (no provision for toll) 12 (no provision for toll) 11, 12 07, 11, 27 08, 12, 28 07, 08, 11, 12, 27, 28 09, 11, 29 10, 12, 30 09, 10, 11, 12, 29, 30
Subtotal rural Subtotal urban	01, 03, 05, 07, 09, 11, 21, 23, 25, 27, 29, 31, 51 02, 04, 06, 08, 10, 12, 22, 24, 26, 28, 30, 32, 52
Total	Sum of two lines immediately above



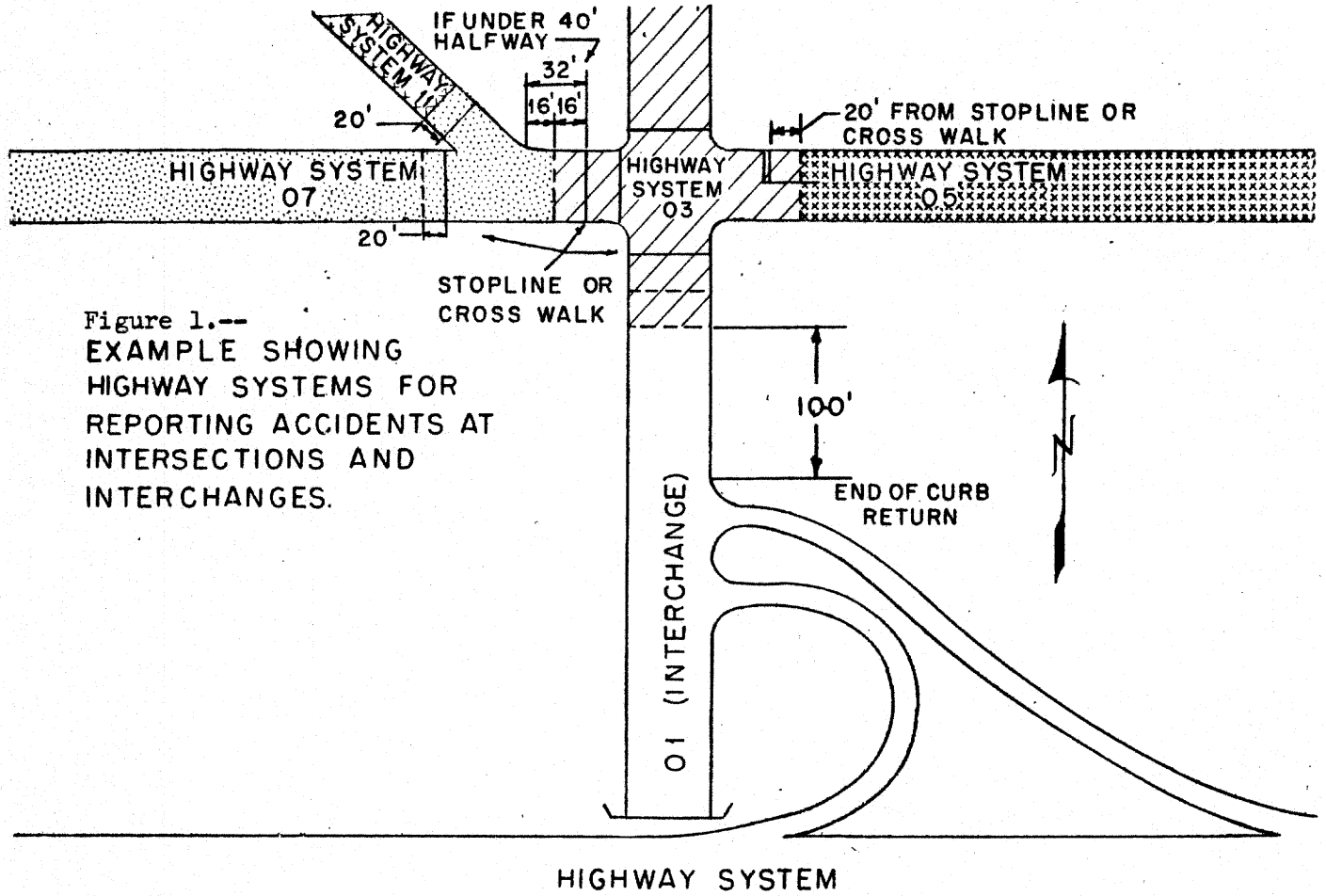


Figure 1.--
EXAMPLE SHOWING
HIGHWAY SYSTEMS FOR
REPORTING ACCIDENTS AT
INTERSECTIONS AND
INTERCHANGES.

