

MANUAL OF INSTRUCTIONS FOR RURAL ROAD INVENTORY

HIGHWAY PLANNING SURVEY
VERMONT STATE HIGHWAY DEPARTMENT

In Cooperation With

BUREAU OF PUBLIC ROADS
U. S. DEPARTMENT OF COMMERCE

JUNE 1949
EDITION OF 1956

TABLE OF CONTENTS

PART I
Inventory Procedure

	<u>Page</u>
Chapter I	Purpose of Manual 1
Chapter II	Purpose of Inventory 1
Chapter III	Organization 2
	1. Supervisor 2
	2. Recorder 3
	3. Chainman 3
	4. Hours of Work 3
	5. Equipment 3
Chapter IV	Instructions to the Recorder 4
	1. The Recorder 4
	2. Maps 5
	3. Road Numbers 5
	4. Zones 5
	5. Recording Notes 6
	6. Page Numbering of Field Notes 7
	7. Disposition of Field Notes 7
Chapter V	Instructions to the Chainman 7
Chapter VI	The Car 8
	1. Type of Car 8
	2. Red Flags 8
Chapter VII	Inventory Procedure 8
	1. For Main Routes and Connections Through Cities 8
	2. Unincorporated Places 9
	3. State and County Line Roads 10
	4. Equations 10
	5. Road Intersection and Identifi- cation in the Field 10
	6. Questionable Roads 11
	7. Structures and Other Items Off the Road to be Inventoried. 11
	8. Weather and Surface Conditions. 12
	9. Road Description 12
	10. Sidewalks 13
	11. Closed or Abandoned Roads 13
	12. Impassable Roads 14
	13. Determination of Road Status 14
	14. Drainage Structures and Others. 14
	15. Delimiting Urban Areas. 14

		<u>Page</u>
Chapter VIII	Classification of Road Types	15
	A. Primitive Road	15
	B. Unimproved Road	15
	C. Graded and Drained Earth Road	15
	D. Soil Surface Road	16
	E. Gravel or Stone Road	16
	F. Bituminous Surface-treated Roads	16
	G. Mixed Bituminous Road	17
	H. Bituminous Penetration Road	17
	I. Bituminous Concrete, Sheet Asphalt or Rock Asphalt Road	17
	J. Portland Cement Concrete Road	18
	K. Brick Road	18
	L. Block Road	18
	M. Combination Type Road	18
Chapter IX	Structures and Railroad Crossings	19
	1. Bridges and Culverts	19
	2. Toll Bridges	20
	3. Grade Crossings	20
	4. Underpasses	20
	5. Overpasses	21
Chapter X	Mail and School Bus Routes	21
Chapter XI	Symbols and Abbreviations for Use with Form 6-HPS	22
Chapter XII	Sample Sheets and Instructions for their Use	25
	Instructions for Form 6-HPS	28
	Instructions for Measuring Roadway and Pavement widths on State Highway and Connections	29
	Instructions for Bridge Sheet	32
Chapter XIII	Inventory of Incorporated Places	38
	1. Inventory Procedure	38
	2. Identification of Corporate Boundaries.	39
	3. Designation of the Central Business District	39

MANUAL OF INSTRUCTIONS FOR RURAL ROAD INVENTORY

Part I

Inventory Procedure

MANUAL OF INSTRUCTIONS FOR RURAL ROAD INVENTORY

I. Purpose of Manual

This manual is intended to instruct inventory Supervisors and members of the inventory parties in the general duties and field methods pertaining to the rural road inventories conducted by the State of Vermont Department of Highways, in cooperation with the Bureau of Public Roads, U.S. Department of Commerce. It will not answer all possible questions that may arise in the conduct of the work, but it will enable employees to enter upon their positions with a clear knowledge of their principal duties. As need is found for additional information or instructions, the employee should at first opportunity make inquiry of his immediate superior. This manual is issued to each employee on the road inventory operations and should be retained for reference. Supplements covering special duties or additional work will be issued from time to time as needed.

II. Purpose of Inventory

The inventory is being made for the purpose of obtaining sufficient data for a report to the legislature on the condition of town highways, and to permit the drafting of maps to a large scale showing thereon all, ^{private and} public roads outside of, and principal street connections through, cities, incorporated towns, ^{Urban Centers} and villages, the location of important structures on the roads such as farm units, dwellings, schools, churches, and other items hereinafter enumerated. The data to be obtained will also permit the compilation of statistics on the mileage of the several types of roads and streets, kinds of structures, and other items mentioned in the instructions below and others that may

be subsequently required by special instructions supplemental to this manual.

III. Organization

1. Supervisor. For the purposes of this inventory the State will be divided into two sections and a Supervisor will be assigned to each section. These Supervisors will establish headquarters at the main office and report in Monday of each week. While in the field the Supervisor shall furnish the central office with his complete address, showing how he may be reached by telephone or telegraph. His duties will be to see that the details of the inventory are accomplished and that the members of the inventory parties are at their posts. The duties of the Supervisors are not subject to exact limitations because of the changes likely to be needed in the conduct of the inventory. They will be responsible for the proper instruction of Recorders or Chiefs of Parties, where employed, for shifts of inventory parties or changes in personnel thereof, for substitutions to relieve men ill or unable to work, for the immediate distribution of supplies, the repair or replacement of equipment, the final collection of such equipment on completion of the work, the time of work or absence from work of members of the inventory party, and the regular systematic collection of the inventory records. It will be one of the Supervisor's principal duties to keep himself informed at all times as to the program of work to be followed by each party in order that at any time he may contact them in the field with as little delay as possible. He will visit inventory parties frequently and inspect all field notes and maps before turning them in, and keep himself informed as to the character and progress of the work.

The Supervisor will use form 2-HPS for reporting on his work. This report will be prepared at the end of each days work and mailed promptly to the central office, giving his whereabouts and how he can be reached by wire when away from headquarters.

2. ^{Chief} Recorder. The Recorder will be responsible for the notes recorded in the field and on the maps, and will have charge of the work and be responsible for the progress made and the field record submitted. He will prepare a daily report (Form 1-HPS) of work performed and miles traveled and mail it to the central office at the close of each day's work. He will record all notes of the inventory and will perform such other duties as may be assigned to him by the Supervisor.

3. ^{Recorder} Chainman. The Chainman will operate the car under the general direction of the Recorder and in such manner as best to assist the inventory work. He will also assist the Recorder in such measurements as are necessary in connection with the inventory work and perform such other duties as may be assigned to him.

4. Hours of Work. The hours and working conditions for field parties unless otherwise specifically provided, will be those established by the State Highway Board for survey parties in the field. The location of living quarters for the members of a field party shall be such as to permit the party reaching the work within a short driving period. (Usually headquarters for the party will be at a point located near the center of the county.)

5. Equipment. The equipment of the inventory parties will usually consist of the following items:

- (1) Automobiles equipped with a trip odometer, reading in miles and hundredths.
- (2) One 50-foot metallic tape divided into feet and tenths of feet.
- (2a) One filler for same.
- (3) One 100-foot steel engineers chain (where required).
- (4) One hand level, clinometer or grade instrument (gradometer).
- (5) One tire gauge.
- (6) Loose-leaf notebook with sheets printed and ruled as indicated on the accompanying Form HPS-6.
- (7) Map board (approximately 20 by 24 inches).
- (8) Maps of the area being inventoried (county, township, and municipal, and U.S. Geological quadrangle maps where available).
- (9) Stationery, report forms, colored pencils, etc. Notes to be recorded with a 2H or 3H pencil.
- (10) Two red flags (18 to 24 inches square).
- (11) Topographic maps of areas (when obtainable).
- (12) Clip board, size 9 by 13 inches, for note sheets.
- (13) Engineers scale, 6 inches, graduated in tenths of an inch.
- (14) Small triangle.

IV. Instructions to the Recorder

1. The Recorder will be in charge of the field party and will report to and accept instructions from a designated Supervisor. He will record all notes. Notes for crossings and bridges will be placed on appropriate special forms and other notes on a field note sheet (Form 6-HPS) provided for the purpose. The Recorder also will make such notations on the maps as are found necessary or desirable for a clear interpretation of the record. He will be responsible for the progress and accuracy of the work and endeavor in every way possible

to secure a complete inventory of the items enumerated in the foregoing paragraphs.

2. Maps. Latest revisions of planning survey fullscale general highway county maps and town maps with road numbers will be furnished to the inventory parties. Supplemental sheets for enlarged areas will be included. Maps will also be supplied for all counties adjoining the area to be inventoried. Within a town a number will be assigned to each road not previously numbered. These numbers will be so selected as to avoid duplication with all other numbered roads.

3. Road Numbers. All town roads have been numbered on a large town map (scale 1 inch equals one half mile) by towns. The state aid roads are included in this numbering system and are given the low numbers. Important town roads are next in sequence. The numbering of all other roads then begins at the top of the map and are numbered to the left and down the sheet so that the numbers increase in sequence from the top to the bottom. A road not shown on the map will be assigned the number of the road with which it connects and a letter added, thus: 30-A; this new road will be plotted on the town map at the time of the inventory for the road.

4. Zones. For convenience in programming the field work the State will be divided into zones and maps will be furnished each party with the work zones indicated thereon. As the town is the unit of work each town will be completed and submitted to the Supervisor before another town is started, unless otherwise arranged. The Recorder will keep the Supervisor informed as to the town being inventoried and when

one zone has been completed he will proceed to the next, according to a prearranged schedule.

5. Recording Notes. At the beginning of each day's work the date, number of the inventory party, name of each member of the party, and the number of the road will be noted in the space provided at the top of the page. A new page will be used when starting each road inventory and at each town line. On each succeeding page of the day's notes the number of the page, the date, the number of the road and the town will be noted at the top of the page. At the beginning and end of each day's work the hour will be noted on Form 1-HPS in the space provided.

The ruled vertical center line of the page (Form 6-HPS) will represent the center line of the road traveled. At the beginning of the inventory a point will be marked "Begin" on the ruled center line near the bottom of the first page and will be identified by the odometer reading at the time for starting and a description of the fixed point on the road at which the inventory started. This point will have been previously selected by the Supervisor. Starting from this point and proceeding along the first road to be inventoried, the succeeding inventory notes will be entered in the order taken, from the bottom to the top of the page, and dimensions and objects will be indicated on, or to the right or left of the ruled center line in accordance with their position on, or to the right or left of the center line of the road when facing in the direction traveled.

Spaces between recorded points on the center line of the road and transverse distances to objects off the road need not be plotted to scale. The stations (or location of the points on the center line

of the road) will at all times be indicated by the reading of the odometer of the car at the points to be recorded. Where the distance between odometer readings for items of inventory is too short to record in hundredths of a mile, show the proper relations of items by the order of recording in the notes. Estimate hundredths of a mile where necessary. When the inventory of a road has been completed the total mileage should be checked with the mileage on the map. A substantial difference between the measured and mapped distance will indicate a possibility of error which should be immediately investigated and all doubt removed.

Transverse distances to objects off the road should be estimated if more than 200 feet, but for objects within 200 feet of the center of the road the distance out need not be recorded. When recorded, the distance should be entered to the right or left of the ruled center line in the space between the noted stations on the center line and a plotted indication of the symbol or object.

6. Page Numbering of Field Notes. The field note sheets for each road for each day will be given pencil numbers in the field. The permanent page numbers will be placed on the field sheets in the office after all the sheets are assembled for a road.

7. Disposition of Field Notes. The field notes will be turned over to the Supervisor for inspection and approval. Any errors or omissions will be corrected before the notes are sent to the office.

V. Instructions to Chainman

1. The Chainman will drive the car as directed by the Recorder

and in such a reasonable and careful manner as will permit of the maximum progress of the inventory. He will see that the car is maintained in good running order and at all times supplied with fuel and oil, and the tires properly inflated to the standard pressure. Tire inflation should be tested daily with gauge furnished the party in order that the odometer readings may be kept uniform and accurate.

VI. The Car

1. Type of Car. Before a car is used the accuracy of the odometer will have to be tested on a measured 5 mile course. First all tires will be inflated to the pressure which will be used throughout the inventory. Odometers with a variation of more than 2% cannot be used. A record will be kept of the test and a factor computed if necessary. The tires should be checked every day and the test repeated at intervals.

2. Red Flags. Two flags (red) will be supplied to the party, one of which will be displayed on the rear of the car at all times while the inventory is in progress, the other flag will be used when necessary to slow down traffic while road or bridge measurements are being taken. These flags should be not less than 18 inches square.

VII. Inventory Procedure

1. For Main Routes and Connections Through Cities. The inventory of cultural items along a route will be discontinued at the limits of cities, urban compacts, and incorporated villages. The corporate limits, city lines or delimited urban compact boundaries shall be located in such instances. Federal-aid, federal-aid secondary, state

FA
FAS
SA

primary, and U.S. numbered routes through all incorporated places will be logged, and the surface type, width, condition, and the names of the streets followed will be recorded. Surface types will be designated according to the letter classifications in Article VIII (Page 15) and widths measured between curbs. Where there are no curbs, the widths to be shown should be those normally available for use by moving and parked vehicles. Each street comprising a through connection of a local road with any of the above-described routes within a city will be logged, and surface types and widths recorded as above. Proceed from the city line by the shortest route, recording the names of the streets followed and the odometer reading at the junction with the nearest State or U.S. numbered route. However, no roads or streets within the cities of (List will be furnished) will be logged as the required data can be obtained from city records. As an aid to mapping and determination of distances, an odometer reading will be taken at the center of each city or other community. Centers shall be selected at points from which it is customary to measure road distances, such as a public square, city buildings, intersections of principal through routes, etc. In addition thereto the location of the railroad station serving each community will be determined. When a road has been completed it should be immediately colored in red.

2. Unincorporated Places. In the case of unincorporated communities, the principal routes through the village and all side roads and streets will be logged with respect to length, width, type, and condition of surface, and inventory taken of the cultural features on each road or street. The number of houses on each side of the road in each block, if blocks are defined, otherwise for each tenth

of a mile, should be reported; dwellings, stores, etc., given separately. Inventory of bridges of ~~6'~~ span and over, and of all railroad crossings should be included on the side roads and streets as well as on the through routes. The name of the village should be noted. Regardless of whether side streets exist, all hamlets and cross-road settlements, however small, should be recorded in the notes by local name and odometer reading. Where necessary to clarify the record in densely settled sections, a sketch should accompany the field notes.

3. State and County Line Roads. All roads on State lines will be inventoried but no off-road culture will be noted beyond the border of the State under inventory.

4. Equations. Whenever it is necessary, for any reason, to operate the car for purposes other than measurement of distances, the odometer readings at a readily identifiable point on the road must be taken and recorded in the proper place on the ruled center line. On resumption of measurement, the car will be returned to the same point and if the car is equipped with a trip odometer it will be set to the same reading, eliminating all equations. If there is no trip odometer on the car, the equation will be completed by recording a second reading of the odometer at the same point on the ruled center line. Such equations should be distinctly shown and underscored in red.

5. Road Intersection and Identification in the Field. At road junctions and intersections the directions of the other road or roads in relation to the center line of the road being traveled, will be

shown in the notes by a single red line with an arrow head intersecting the ruled center line at angles formed by the intersecting roads. If each of the intersecting roads is designated by a number on the map provided, or a number has been assigned in accordance with the instructions above, these numbers should be noted on the lines representing them in the notes.

6. Questionable Roads. Where roads appear to be public but are not shown on the map furnished by the State, their location will be determined by compass for general direction of each section so that the general course may be approximated and complete notes taken as for the other rural roads which are shown on the map. Occasional tie-in to fixed objects or land lines should be made where possible. The status of such roads - public or private - will be determined later before they are included as public roads. Each of such roads will be sketched on the map in its approximate location and a detailed large scale sketch furnished showing all the angles.

7. Structures and Other Items off the Road to be Inventoried. All farm units, dwellings, schools, churches, public meeting houses, public cemeteries, hotels, resorts, tourist camps, stores, mills, factories, canneries, mines, ball parks, fair grounds, public and private golf grounds, country clubs, railroad stations, and other similar places outside of cities, incorporated towns and villages and urban compacts served by the road being inventoried (not inventoried on another road) will be noted by name or symbol, and located by odometer reading as provided above.

To avoid duplication where rural schools, farm units, etc., are

located at road intersections, the feature will be inventoried on the road from which the principal entrance leads. If entrance is from both roads, the one of major importance should govern. Where this distinction cannot be made, the item should be inventoried from the important road.

8. Weather and Surface Conditions. If the weather or road conditions are not satisfactory for field work, work for that day will be abandoned. When it is necessary to suspend field work for a fraction of a day or more, the Supervisor and Recorder should use such time for the purpose of securing data required for the inventory from the Town Officials.

9. Road Description. On the left side of Form HPS-6 in columns provided will be recorded for each road inventoried, the system, surface type, width, condition, etc. One column will be used for each section of road, throughout for which all descriptive items which apply will be checked or noted. Where a change in road characteristics occurs, a new section will be made and complete information with respect to all features will be entered in the next column. A new section should be made at each junction or intersection where a marked change in traffic volume is likely to occur. The direction taken by the inhabitants of a road to do their shopping or in their daily pursuits should be indicated by an arrow on the map. If no distinction can be made, indicate by a double arrow.

In the column provided, a record will also be made of the road type giving width and specific type of surface, width of roadbed, shoulder to shoulder, and station at which a change in type or width occurs. Where the width of the improved surface is not uniform, the

prevailing width of the traveled way or improved surface, as well as roadbed width, will be noted. Where a stream, river, or lake approaches close to the roadway on either side, show on the note sheet the limits within which this occurs--station to station; also show distance from shoulder of road to bank of stream. In like manner, record stations between which the road is restricted on either or both sides by any similar barrier such as a large drainage ditch, canal, retaining wall, railroad track, etc.

On all roads a note will be made of the location of points where the width is markedly restricted, especially where the width is so reduced as to be insufficient for safe passing.

10. Sidewalks. Where a side walk or bicycle path of 500-foot length or more is found (outside corporate limits of cities, towns, boroughs, villages, or delimited areas) its beginning, end, location on right or left, and kind will be noted.

11. Closed or Abandoned Roads. When a road is closed by a fence or any other obstruction which appears to be for the purpose of closing the road permanently, the inventory should stop at the barrier and the facts should be recorded in the notes. A note should also be made in such cases to show whether or not the road beyond the fence or obstruction appears to have been used recently, is bordered by fences, or show other evidence of having been a public road at one time. Where a road is shown on the map, but on the ground appears to be closed or untraveled, treat as above described and make a suitable notation on the map to indicate the correction. Such closed roads need not be inventoried. This does not apply to roads open to the public but having gates across them to retain cattle.

12. Impassable Roads. Where a section of road is impassable for automobile travel and should be included in the inventory being taken, it may be measured with a 100-foot steel chain, and steel surveyors pins used as markers and for counting each 100-foot length of chained distance.

13. Determination of Road Status. The field party should not attempt to determine whether or not a road is legally a public road. However, where a road is not shown as a public road on the map, inquiry may be made at nearby habitations for facts which might aid in arriving at a decision as to its public or private status. The notes should show the information used as a basis for the inventory of such roads.

14. Drainage Structures and Others. All bridges and other structures carrying the road and having a total opening measured along the center of the road of 4.0 or more feet will be inventoried. All other structures crossing the highway over or under grade or at grade which serve public or private properties will be inventoried.

15. Delimiting Urban Areas. All unincorporated urban areas in Vermont having a population of 800 or more have been delimited and boundaries established. During the course of the inventory each of these areas will be examined to determine the advisability of revising the existing lines, because of the erection of new houses or enterprises which might be considered urban.

(a) Field Procedure. The inventory in the field will proceed as usual and no delimiting work will be done until the notes are analyzed in the office.

(b) Office Procedure. The field notes for each urban area will be examined closely in the office as the culture is transcribed from the notes to the map. This method will immediately indicate new buildings beyond the compact lines and such areas will be investigated to determine if a new delimitation is necessary. From previous observations it is not expected that there will be many changes in these lines. If such changes are found necessary the procedure as set forth in Appendix III of the Public Roads Administration Manual will be followed.

VIII. Classification of Road Types

Each section of road will be classified by inspection and a record made on Form 6-HPS under one of the following types:

A. Primitive Road. An unimproved road (on which there appears to be no public maintenance) and may or may not be traveled or passable. If impassable it should be classified as untraveled (U).

B. Unimproved Road. A road composed wholly or with minor exceptions of the natural ground of the region traversed, which may or may not have been bladed, which does not conform in respect to alinement, grade, and drainage at least to the definition of a "Graded and Drained Earth Road" and on which the only work that has been done by public authority is that required to maintain a condition of bare passability for horse drawn or motor vehicles.

C. Graded and Drained Earth Road. A road of natural earth alined and graded to permit reasonably convenient use by motor vehicles and drained by longitudinal and transverse drainage systems

(natural or artificial) sufficiently to prevent serious impairment of the road by normal surface water.

D. Soil Surface Road. A road possessing the quality of (C.), which has been improved to provide a more adequate traffic service by the addition of sand, coarse loam, or a light course of gravel, but not in a sufficient amount to prevent a "break-through" in the spring.

If a highway previously graveled does not qualify as a gravel road but has a better surface than a graded and drained earth road, it should be recorded as soil surfaced.

E. Gravel or Stone Road. A road, the surface of which consists of gravel, broken stone, slag, slate, shale, disintegrated rock, or other similar fragmental material (coarser than sand).

Definition of Gravel Highway. A gravel highway as applied to town highways is defined as a highway having a gravel base and width sufficient to provide reasonable transportation facilities at all times of the year according to the classification of the highway.

Determination of Road Type. In determining the type of road the Selectmen and Road Commissioners should be consulted. The road may have been graveled but not with a sufficient quantity to provide a passable road during the spring of the year. If the town officials say the road "breaks through or mudds up" during the spring, it should not be called a gravel road.

F. Bituminous Surface-treated Roads. A gravel road, to which has been added by any process, a bituminous surface course with or

without a seal coat, the total compacted thickness of which is less than one inch, and is referred to in Vermont as a surface treated gravel road.

G. Mixed Bituminous Road. A road, the wearing course of which is ^{2 1/2"} ~~one~~ inch or more in compacted thickness, composed of gravel, stone, sand, or similar material mixed with bituminous material under partial control as to grading and proportions.

(G-1) Low Type. A mixed bituminous road as above described, the based course of which is a non-rigid type and the combined thickness of surface and base is less than 7 inches.

(G-2) Paved or High Type. A mixed bituminous road as described, the base course of which is a rigid type of any thickness or a non-rigid type of such thickness that the total depth of surface and base is 7 inches or more in compacted thickness.

H. Bituminous Penetration Road. A road, the surface course of which is ^{3"} ~~one~~ inch or more in compacted thickness composed of gravel, stone, sand, or similar material bound with bituminous material introduced by downward or upward penetration.

(H-1) Low Type. A bituminous penetration road as above described, the base course of which is a non-rigid type and the combined thickness of surface and base is less than 7 inches.

(H-2) Paved or High Type. A bituminous penetration road as above described, the base course of which is a rigid type of any thickness or a non-rigid type of such thickness that the total depth of surface and base is 7 inches or more in compacted thickness.

I. Bituminous Concrete, Sheet Asphalt or Rock Asphalt Road. A road on which has been constructed a surface course one inch or more

1 NOTE: There is no type G-1 used in Vermont. Before any superior to gravel surfaces are constructed in Vermont a gravel base, the equivalent of 12" is first applied.

in compacted thickness consisting of bituminous concrete or sheet asphalt, prepared in accordance with precise specifications controlling gradation, proportions and consistency of composition, or of rock asphalt. The surface course may consist of combinations of two or more layers such as a bottom and top course or a binder and a wearing course.

J. Portland Cement Concrete Road. A road consisting of Portland cement concrete with or without a bituminous wearing surface less than one inch in compacted thickness.

X K. Brick Road. A road consisting of paving brick with or without a bituminous wearing surface less than one inch in compacted thickness.

L. Block Road. A road consisting of stone block, wood block, asphalt block, or other form of block, except paving brick, with or without a bituminous wearing surface less than one inch in compacted thickness.

Where the bituminous classifications (F, G, H, or I) cannot be determined in the field, surfaces of this general type should be reported as Low-type Bituminous or STG (surface treated gravel). The office records for superior to gravel surface, are very complete and the exact type can be reconciled later.

M. Combination Type Road. A road, the wearing course of which consists of two or more individual types, each being of such depth as to be classed logically as a part of the traffic bearing road surface rather than as surfaced shoulders.

The Town Officials usually know the type on state-aid and town roads and should be consulted. If their interpretation appears to be conclusive, record the exact type.

IX. Structures and Railroad Crossings

1. Bridges and Culverts. The location of all bridges as covered in Section 14 of Article VII will be indicated on the note sheet (Form 6-HPS), recording the odometer reading, and by an arrow the direction of stream flow. On the Bridge Sheet (Form 5-HPS) will be entered the descriptive information and dimensions called for below.

- (a) Location by odometer reading and by name of stream, if known.
- (b) Kind of crossing: Underpass, Overpass, Bridge over Stream, etc.
- (c) Description of Bridge: Type to be shown for each span, as Truss, Girder, I-Beam, Arch, Culvert, etc.
- (d) Clear span or spans.
- (e) Materials: Steel, timber, masonry, concrete, etc.
- (f) Width between curbs or clearance between railings where there is a roadway only. Note width of sidewalks.
- (g) Maximum distance to stream bed from bridge supports.
- (h) Minimum overhead clearance.
- (j) On all bridges note present condition, as to maintenance of superstructure, floor, and substructure: describe condition of masonry or concrete, whether first class or cracked, honey-combed, spalled, etc. Also note if superstructure is well painted, or if paint is in fair condition, or steel is badly corroded or rusted.
- (k) Where there is evidence that the waterway opening is inadequate the facts should be noted under "Remarks" on reverse side of sheet. This information should be obtained from the Selectmen.
- (l) Important bridges consisting to two or more spans should be briefly described where necessary to clarify the foregoing data.

Note: Show by sketch on note sheet, bad or dangerous alinement or very steep grades at bridge approaches.

2. Toll Bridges. If a bridge is a toll bridge, make a note to this effect at the top of the Bridge Sheet and state whether it is publicly or privately operated.

3. Grade Crossings. On all crossings at grade, record the odometer reading on the centerline of each track, the number of tracks, main lines or sidings, and the type of protection.

4. Underpasses. (Highway under railroad or another road)
The Bridge Sheet (Form 5-HPS) will be used to record the following information:

- (a) Name of railroad or highway crossed and number of structure, if any.
- (b) Number of RR tracks, or traffic lanes on road above if bridge carries a highway. (Where lanes are not marked show width of surface or traveled way.)
- (c) Type of Construction: Concrete, Stone, Timber, etc.
- (d) Minimum horizontal clearance of roadway.
- (e) Show width of each traffic lane separately where center piers or columns divide roadway. Show sidewalk width, if any.
- (f) Minimum vertical clearance.
- (g) Make sketch to show any unusual or hazardous condition in alinement or grade.
- (h) Record age, condition, maintenance, etc. See page 19, Bridges and Culverts, Item J.
- (i) Number of spans, length of each span, and total length. However, where the underpass is of a "Combined" type in which the highway crossing is incidental to the main bridge over a stream or valley, other railroad, etc., give information on the span over the highway only.

5. Overpasses. (Highway over-railroad or another highway.)
- (a) Name of railroad or highway crossed, number of structure, if any.
 - (b) Number of railroad tracks, or traffic lanes on road below if bridge is over a highway. (Where lanes are not marked, show width of surface or traveled way.)
 - (c) Type of bridge: Length of structure, clearances, brief descriptions; age, condition, etc.

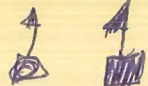
Caution: Care should be taken in the use of steel or "metallic" tapes near all wires and transmission lines.

X. Mail and School Bus Routes

All routes covered by the rural free delivery (R.F.D.) and school bus routes shall be determined and indicated on the map by outlining the road as follows: Green: R.F.D. routes. Blue: School bus routes. This can be readily determined by questioning the Selectmen and Road Commissioners and by noting the existence of mail boxes.

XI. Symbols and Abbreviations for Use with Form 6-HPS

- F-1 Farm unit (1st class): Dwelling with moderate or large sized barn with outbuildings. A place whose general appearance indicates that the production of crops, livestock, dairying, etc., is the principal business. This can be determined by acreage under tillage, size of barns (not condition) and general appearance.
- F-1 Farm unit (2 or more houses): Estate or farm with central dwelling and tenant dwellings on farm. (Number of tenant dwellings and approximate location to be shown).
- F-2 Farm unit (2nd class): Rural dwelling with small acreage. A place, generally less than 5 acres, with few outbuildings and small cultivation; appearance indicating that the occupant earns his living elsewhere. A small place where garden stuff, fruit, chickens, etc., may be raised on a small scale not of commercial importance. In all cases each dwelling should be noted separately, or the number in a group indicated where houses are closely spaced.
- ✓ T.H. Township hall or other similar place of public meeting
- ✓ G.C. Golf grounds or country clubs
- ✓ S.C. Summer cottage
- M-1 Mills and factories (note kind and name)
- M-2 Mines
- ✓ G.P. Gravel pit (active)
- ✓ B.P. Ball park
- ✓ H. Dwelling house
- ✓ L. Lake - show name and distance from near shore line

- ✓ Sch School 
 ✓ Ch Church
 B. Business establishment (without dwelling)
 ✓ Cem. Cemetery
 P.P. Public Parks (Note kind - State, County, etc.)
 F.G. Fair grounds
 Ry.S. Railroad Station
 ✓ T.C. Tourist camp or court *+motel*
 F.L. Fishing Lodge
 ✓ R.H. Resort hotel
 ✓ F.T. Fire tower
 S.P. Scenic Point (Where turnout provided on road)
 Ind. Small industry - show kind
 ✓ O.T. Outdoor theatre
 A.P. Airport
 H.L. Hunting lodge
 ✓ L.C. Logging camp
 ✓ S.M. Sawmill (other than portable)
 B.H. Business establishment and house combined
 Q. Quarry (active)
 E. Night club or dance hall

Note: Farm units, rural dwellings, or other habitations will be inventoried without regard to whether they are occupied or vacant. However, those which appear to have been long abandoned and show definite signs or disintegration or decay will be indicated in the notes by adding the letter A. Example: F-1-A, abandoned farm unit (1st class); SC-A, abandoned summer cottage; etc. Habitations or other features which are largely wrecked or beyond repair will be ignored. In the case of schools, churches, or other facilities reasonably serviceable but no longer in use, the letter V should be added to the appropriate symbol, e.g., an abandoned school house would be indicated as S-V.

Abbreviations shown above and others appropriate for describing additional cultural features may be prefixed by a small square or other convenient figure on note sheet to represent objects inventoried.

XII. Sample Sheets and Instructions for Their Use

INSTRUCTIONS FOR FORM 6-HPS

1. System. Record the administrative system to which the road belongs; state, ^{C-1, C-2, C-3, C-4, C-5} state aid, town, private, state forest, national forest, toll, etc.

2. Federal Aid or Federal Aid Secondary. To be filled in by office force.

3. Surface Type and Width. Use standard code as described on page 15 of the manual. Show width of surface or traveled way, and roadbed width shoulder to shoulder. Thus, F-18-24 would indicate an 18-foot bituminous surface on a 24-foot roadbed, and E-10-12 indicates a 10-foot gravel surface on a 12-foot roadbed.

4. Ditches. Use following code.

None	0
Rough	2
Complete	1

5. Condition. Use following code

(1) Good: Roads having a fairly uniform cross section, free from large stones, gullies, ledge, bumps and continual ruts, and permitting a speed of 40 miles per hour.

(2) Fair: Roads having slightly irregular cross section, but not serious enough to prevent traveling at a speed of 25 miles per hour. Surface may contain slight irregularities, some stones near the edge.

(3) Poor: No evidence of blading, cross section very irregular, travel tracks sunken with hump in the middle, ledge outcrop in traveled way and continual ruts in wet areas.

6. Class*State-Aid

Class A - State-aid highways carrying a traffic volume of 150 or more vehicles per day.*

Class B - All other state-aid highways not included in Class 1.

Town Highways

Class 1 - Most important town highways in each town carrying a traffic volume of 25 or more vehicles per day.

Class 2 - Town highways providing outlets for farms or year round dwellings.

Class 3 - Town highways providing access to farmlands, pastures, woodlands, etc.

7. Cost Per Mile. Enter the average cost per mile.

8. This information will be compiled in the office unless the actual cost per section is compiled in the field.

*See Part II, Road and Bridge Needs for Standards and Estimated Cost.

Instructions for Measuring Roadway and Pavement Widths on State Highway and Connections

The pavement and roadway widths of all state highways and their connections are to be measured to provide a usable current record. Previous experience indicates that the widths will vary considerably over short distances in rural areas, particularly because of maintenance operations. The final objective is to obtain a record which will show the representative average width for any section excluding short variable sections. On variable sections the average minimum width should

be obtained, excluding those sections less than 500 feet unless the change in width is two or more feet on each side. Where pavement widths have been widened through maintenance, include in the width only such parts having sufficient stability. Raveled or sloping edges should be included as part of the shoulder. On old concrete the existence of guard rail reduces the effective shoulder width about 1.0 feet. On such sections the shoulder width should be recorded where this condition prevails for a distance of 500 feet or more. In the case of questionable sections the distance between guard rails can be measured and this will provide the minimum width. An accurate record of the surface type is kept in the office, however, the type should be recorded by the field party to the best of their ability.

Type of Shoulder. Record the surface type and width of all shoulders but do not record as surface treated or paved unless the surface is sufficiently stable. Broken, raveled sections or sections less than 1.5 in width should be recorded as gravel or earth whichever predominates.

Urban Areas. In urban areas all changes in width shall be recorded. Record the presence of all curbs in urban areas having a length of approximately 50 or more feet, and any other solid obstruction which restricts the pavement or roadway width. Record the presence of all combination surface types.

Banks and Other Obstructions in Rural Areas. Record the existence of all banks retaining walls, cribwork, ledge or any other obstruction within 8 feet of the edge of the pavement, having a length of 100 feet or more along the highway. Roadway measurements should be taken at such places and the distance from the edge of the pavement and a description of the obstruction should be recorded.

INSTRUCTIONS FOR BRIDGE SHEET

1. Inventory all structures of ^{6'}4-foot span and over. In agreement with Federal Aid standards a bridge is defined as a structure including supports erected over a depression or an obstruction, as water, highway, or railway, having a track or passageway for carrying traffic or other moving loads, and having a length measured along the center of roadway of more than 20-feet between underscoping of abutments or spring lines of arches, or extreme ends of openings for multiple boxes and pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

For structures from 4 to 10 feet inclusive it will not be necessary to fill out the entire form but the information may be entered as follows: Under length of span and type, 8 x 4 x 18 stone box - Railroad rails and stone slabs. Describe any defects and indicate what improvement is needed. If the structure is found to be adequate note "ok" after improvement needed. The estimated cost will be computed by the office force.

For all structures over 10-foot clear span complete all items on the bridge sheet.

2. Show kind of crossing by checking descriptive item applicable. For multiple-span bridges give complete information on each span, including approach spans. Indicate on log sheet the odometer reading, position and angle of skew of structure with respect to center line of road and by arrow the direction of stream flow.

3. Give information on the span over the highway only.

4. For span length on steel bridges use center to center of bearings, otherwise the clear opening. Skew bridges will be measured along center line of road. See Note 1.

5. Show general type such as: Box, Truss, Girder, I-Beam, T-Beam, Rigid Frame, Arch, Slab, Suspension, Covered Bridge, etc.

6. The length of a bridge structure is the over-all length measured along the line of survey stationing back to back of back-walls of abutments, if present otherwise end to end of bridge floor, but in no case less than the total clear opening of the structure.

7. Give minimum lateral clearance. Where traffic lanes are separated by bridge members, show clearance width of each lane separately. Special conditions should be explained by notes.

8. In case of overhead bracing or arch construction, measurement shall be made to the lowest clearance point above the road surface.

Form 61 HPS
(Revised 1945)

VERMONT STATE HIGHWAY DEPT.
STATE-WIDE HIGHWAY PLANNING SURVEY
in cooperation with
BUREAU OF PUBLIC ROADS

Odometer Correction Factor

To Inventory Manager:

This is to certify that the odometer in the _____
bearing _____ license number _____ (Kind of Car)
(State) 195 _____
owned by _____ and operated by _____

has been tested and in my opinion is in a satisfactory condition for
field use in connection with the Road Inventory.

Odometer Check (Average of three tests)

Measured distance of test run _____ Miles
Odometer distance _____ Miles
Odometer error (/ or -) _____ Miles
Error - per cent (/ or -) _____ Percent
Correction factor _____ Percent
Tire Pressure _____ Lbs.

Road on which test run was made _____

Between what points _____

Distance between termini (chained measurement) _____

Remarks _____

A test of the odometer should be made over a prescribed course
before any field work is done and at periodic intervals thereafter,
not exceeding two weeks; also after each change made in either of the
rear tires of the automobile.

Date _____

Supervisor _____

District _____

XIII. Inventory of Incorporated Places

1. Inventory Procedure - The inventory work will include logging of all streets in cities, villages, and other incorporated communities, with sufficient information obtained to enable a large scale map to be drawn showing the correct layout of the area and all the street intersections, railroads, waterways, public buildings, railroad stations, and other transportation facilities. Other than public buildings and railroad stations all culture will be omitted. This work will be done by one special party trained for this purpose. The car used will be equipped with a footometer for more accurate measuring. The type and width of all through or arterial state aid streets shall be recorded and the sidewalks and curbs noted where they occur on these streets. The surface type of all other streets shall also be recorded. Width measurements on local streets can be omitted. Widths should be measured between curbs where they exist and where there are no curbs the widths to be shown should be those normally available for use by moving vehicles and also parked vehicles. This will include all the available space for vehicles up to the tree or grass line. All street names will be recorded.

Those cities having desirable maps and records will not be logged providing enough data is available for the drawing of large scale maps.

Note should also be made of the existence of street car or railroad tracks wherever they occupy or closely parallel the streets. The location and measurement of all bridges and railroad crossings should be recorded in the same manner as in rural areas. All streets should be identified by name where possible to obtain the information.

Boundaries of the incorporated area should be located and all drainage noted in sufficient detail to allow streams and shorelines to be plotted on the map in their approximate locations, with respect to the street grid, bridges, docks, and other related features.

2. Identification of Corporate Boundaries - Where the inventory is to end at a county, village, township, or city line, and such line is not marked where it crosses the right-of-way or roadway being inventoried the inventory will be continued to a street, road or structure which will permit the boundary line to be tied in with the stationing at the intersecting road. The village trustees will then be contacted as to the exact location of the lines. In addition to this, the details of the outlying boundaries between the roads should be obtained from records or from the village officials so that a complete boundary may be plotted for this village.

3. Designation of the Central Business District - In all cities and other urban communities the inventory party will determine by inspection the area comprising the central business district, which will be defined as follows:

"It is the location in contiguous blocks wherein are concentrated activities of city-wide importance, particularly shopping and business. The financial district, office buildings, and the like, which do not necessarily draw retail customers in the sense of 'shoppers' should usually be included as a part of the central business district, when it adjoins the shopping area.

Surrounding the central business district will generally be a 'fringe' consisting perhaps of tenements, rooming houses, wholesale and light industry neighborhoods. These areas should not be included in the central business area even though contiguous to it".

The area thus determined should be indicated on a copy of the city map. Where no map is available the approximate point marking

