

MANUAL

of

ROUTE LOG AND PROGRESS CHART STANDARDS

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VERMONT STATE HIGHWAY DEPARTMENT

HIGHWAY PLANNING SURVEY

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INTRODUCTION

The Vermont State Highway Route Log and Progress Chart is a straight line diagrammatic record of the physical and geometric characteristics of the highway and the elements of which the road is constructed. In addition it is also a progress chart in that it records the progress made in highway improvements.

At the present time only state highways and their connections are logged. The data from which the log is compiled are taken from field measurements and available records.

These logs are one of the important tools of the highway engineer and provide basic data for planning research and statistics. Therefore it is vitally important that all data used be as accurate as possible in order that the users of these logs may confidently base their plans and statistics on the data derived therefrom.

I. EXISTING SURFACE

The "existing surface" line indicates the most recent surface on the road. It is obtained by projecting the latest surfaces in the "Construction and Maintenance" section up to "existing surface".

Different surface types are separated by ticks drawn on both sides of the symbol band.

II. CONSTRUCTION AND MAINTENANCE RECORD

Construction data are obtained from blueprints of the original route logs which cover the period from 1936 through 1945. Projects for 1946 and later have been recorded in colored pencil. Equations appearing on the old logs will be removed while plotting the new. To conserve year lines where it is possible, projects for more than one year will be shown on the same year line. Projects will be labeled in the following order: (1) project number; (2) length to three decimal places; (3) surface and roadbed widths in feet and prefixed by S and RB, respectively; (4) year of completion if projects for other years appear on the same year line; and (5) all projects shown will be considered to be reconstruction unless noted (surf.) or (surf. and width). The foregoing data will be shown in 0.10" slanting caps (see sample log). If the numbers for old projects are not shown on the blue log, they frequently may be obtained from the "thousand-mile" logs. If a project number cannot be determined and it is known that the job was done by the state, an "St.()" will be noted. When the year of completion cannot be ascertained, a " $\frac{1}{2}$ " may be added to the assumed year, e. g. 1920 $\frac{1}{2}$. When the mileage previous to the first project entered on the new logs is known, it will be shown thus: 1.240-1939 = 1.220-1940.

Maintenance data for the years 1939-1945 are obtained from the blueprints of the original route logs. Data after 1945 are obtained from the yearly maintenance reports. This information will be plotted in hundredths of miles without providing stations in the route diagram. The extremities of each section will be shown by ticks (see sample log). Maintenance work of less than 0.10 mile is not shown, nor is maintenance on gravel. Retreatment will be stippled with #961 Presto-tone and the abbreviation RET lettered in the band underneath the stipple. Resurfacing will be stippled with #963 Presto-tone and the abbreviation RES lettered in the band underneath the stipple. Appropriate stipple should also be placed in the legend. Where a District Engineer has not indicated whether maintenance is resurfacing or retreatment, it will be determined by reference to the District Engineers' "Report of Maintenance Costs".

As in the plotting of projects, an effort will be made wherever possible to combine the years where maintenance occurs. The length of each section of maintenance will be noted with 0.10" slanting numerals to two decimal places. The date will be added to each if more than one year appears on a single year line. Where bituminous concrete resurfacing occurs, complete information on type and method of application will be noted. Resurfacing and retreatment that has occurred prior to a construction project will not be transferred to the new logs.

III. WIDTHS

The surface and roadbed widths are obtained from the 1949-1950 state highway inventory field notes. The surface consists of the actual pavement width; roadbed includes the combined widths of the pavement and the shoulders. Widths obtained from the inventory notes take precedence over those from the original logs. This

is because resurfacing and retreatment (and hardsurfacing of shoulders) sometimes extend the width of the road beyond its original measurement. However, if construction occurred after the highway was inventoried, the widths of the new project as taken from the plan finals will take precedence over the inventory notes. On a section of highway where no shoulders exist, the surface as a rule is limited by curbs. Note of this condition should be made in the following manner: the surface measurement will be placed in its proper location on the line marked "surface" and on the line marked "roadbed". On the roadbed line the measurement will be followed by "C-C", denoting curb to curb measurement. To locate widths from the inventory notes, the odometer readings will be adjusted by the factor obtained from comparing the inventory mileage with the route log mileage. Widths will be noted in 0.10" slanting numerals.

IV ROUTE DIAGRAM

Stations for intersecting roads, structures and other features such as town, village and project lines, will be obtained primarily from the blueprints of the original logs. Reference is then made to the inventory notes. Odometer readings in the inventory notes may be made comparable to route log stations through application of an adjustment factor. The adjustment factor for each town will be derived from comparison of the inventory mileage with the route log mileage. The former will then be adjusted to agree with the latter. The resulting intermediate stations through the town may not agree exactly with the route log stations, but will provide a basis for comparison and will make possible the detection of substantial errors that may have existed in the location of roads or structures on the original log. A change in an original log station will be made only if the difference indicated by the adjusted inventory station is 0.10 mile or more, in which case the new station may be determined by using the adjusted inventory distance to the nearest established feature. The same method will be used in adding features not shown on the original log. Stations will be inked on the new logs in 0.08" slanting numerals. A half-inch line will be used as a base for these stations and a short dash will be placed in the center of the main route band. If too much distortion would be necessary, the entire congested area will be expanded on a 1" = 1000' sheet, with a reference note to it appearing on the 1" = 2000' sheet. The mile divisions on the 1000' sheet will correspond to those on the 2000' sheet (see samples). Where a congested area is too small to justify its enlargement on a 1000' sheet, an inset will be drawn on the 2000' sheet at a scale of 1" = 1000' or 1" = 500' (see sample).

Intersecting Roads will be located according to stations along the main route band, Town and State Aid roads to be 0.10" wide and State and U.S. routes 0.20". These roads project 0.50" from the main route band. Where there isn't room to show features in their proper locations, they may be distorted slightly.

Where a road intersects the main route at other than 90°, it should be shown at an angle of 30° (or less if space requires) from perpendicular in the proper direction. Town road numbers will be obtained from the large town maps that have been corrected to 1949. Where street names replace numbers, they will be shown in slanting lower case letters. "Street" or "St." may be omitted; for road, avenue, etc., standard abbreviations will be used.

For standards for U.S., state, and state aid numbering, refer to "Leroy Standards", page 7 in this manual. In areas where the U.S., state, or state aid roads have street names, both designations will be used.

State aid roads will be stippled with #960 Presto-tone. Road destinations, with an arrow, will be noted for intersecting State, U.S., and Numbered State Aid Routes; also those ordinary State Aid roads which lead directly to a place (see legend). These destinations will be lettered in 0.08" inclined caps and are the names of the nearest large or important settlement.

Bridges will be shown on the new logs according to the dimension detail standards included in this manual. Bridges with a span of 4' thru 10' will be shown with a single dashed line; 10.1' thru 20', 0.05" wide; 20.1' and over, 0.10" wide; and those over 200' should be shown to the route log scale where possible (see legend). Complete bridge information is derived from the 1949-1950 "Bridge Inspection Reports" and after investigation, supercede information on the original logs. These bridges were located in the field according to the original log stations; new bridges will be plotted in their proper location and a station shown. Bridge information will be placed above the main route band, bridge type, rail type and construction date being shown on the title line in 0.10" slanting caps. Information below the title line will be in 0.08" slanting lower case. All abbreviations will be found on the legend sheet and dimension detail standards on the dimension detail sheets for bridges. When a bridge has been widened after the initial construction date, note of this will be made by adding the new date after the original date on the title line and noting the details below the title line (see dimension detail standards). The stream and direction of flow will be obtained from the U. S. Geological Survey sheets and will be placed opposite the bridge, below the main route band, the name to be 0.10" lower case. Bridges will be numbered consecutively by routes. The number will be placed within a 0.15" diameter circle in line with the direction of flow arrow on the lower side of the main route band (see sample log).

Overpasses and Underpasses - Information for overpasses and underpasses will be obtained from the 1949-1950 "Bridge Inspection Reports" and set on the new logs in the same general manner as bridge information. For symbol standards, see legend sheet. Where differences in vertical traffic clearance measurements occur between the old logs and new field measurements, they should be investigated. Where varying vertical clearances exist, they will be labelled with reference to the traffic lanes, e.g., Tr. Cl. Northbound Lane - N. 11.6, Southbound Lane - S. 12.0.

R. R. Grade Crossings - The stations for grade crossings will be taken from the original route logs. The basic information pertaining to protection at these crossings can be taken from the route log data, but the field inventory notes should be checked for additional information regarding protection. The number of tracks at a grade crossing will be shown graphically and the railroad name lettered in 0.08" slanting caps parallel to the tracks. For symbols and protection abbreviations see legend.

Main Route Bands will be 0.20" wide except for state aid connecting links, which will be 0.10" and stippled with #960 Presto-tone.

Village and City Centers will be shown by a solid black circle 0.08" in diameter. The corresponding name will be placed horizontally within 0.50" below the main route band. Names of urban compacts should be followed by the suffix UC; federal aid urban areas FAU.

Population figures will be placed beneath the underlined city and village names. Populations for unincorporated places will be estimated eventually, so space should be provided for them. Estimated populations will be preceded by the abbreviation EST.

Village Limits will be shown according to standards. Where a village line and a state highway limit line are contiguous, a combination of the two symbols will be used (see legend). These lines will be projected vertically to cover the whole sheet extending from the space allotted for traffic through the space allotted for existing surface. Where any two or more political subdivision lines are contiguous, the symbol for the highest order one will be used. Village lines for urban compacts will be labelled "Arbitrary Village Limit" in 0.10" slanting caps.

Federal Aid Urban Area and Urban Compact Lines will be shown according to standards (see legend). Urban compact line locations will be obtained from the original logs.

Locations for federal aid urban area lines will be obtained from the federal aid descriptions and maps of these areas.

FEDERAL AID URBAN AREAS

- | | |
|---------------------------|------------------|
| Barre | Rutland |
| Bennington-Old Bennington | St. Albans |
| Brattleboro | St. Johnsbury |
| Burlington-Winooski | Springfield |
| Montpelier | White River Jct. |
| Newport | |

Urban Compacts:

- | | |
|--------------|------------------|
| Bethel | Island Pond |
| Brandon | West Rutland |
| Brattleboro | White River Jct. |
| Graniteville | |

Town Lines will be shown according to standards and will be projected vertically to cover the whole sheet, as village limits. Town lines are labelled with both town names.

County Lines will be shown according to standards and will be projected vertically to cover the whole sheet as village limits. This line shall carry both county names as well as both town names.

State Lines will be shown according to standards and will be projected to cover the whole sheet as village limits. The names of both states, and abutting towns, shall appear parallel to the state line.

Construction Project Lines will be shown according to standards and will be projected from the main route band only as far as the year line of the specific project.

Village, town, county, state, and state highway limit lines take precedence over project lines where they are contiguous.

State Highway Limit Lines will be shown according to standards and will be used in those places where a change from state highway to state aid connecting link occurs and vice versa.

End of Route will be shown by a heavy solid line and labeled as such (see sample log). This line will be used only where the route ends at an intersection.

Public Service Facilities - Underground - Locations of underground public service facilities such as telephone and power cables, gas or oil pipes, and penstocks will be shown according to standards (see legend). Stations and distance in feet from the pavement edge will be shown where the facility runs parallel to the road. Where a road has been widened after the plotting of the new log, the distance from the pavement edge will be changed accordingly.

V CURVES

Curves will be taken from construction plans and plotted in their proper relationship with other features. They will be shown to the nearest degree.

Curves will be shown on the diagram by adding a line 0.01" thick to the line for curves.

Curves to the left will be spotted above the line, curves to the right below. Degree of curve will be shown in vertical freehand lettering as large as space permits.

VI GRADES

Grades will be taken from construction plans and plotted in their proper relationship with other features and shown to the nearest tenth per cent. Grades will be shown on the diagram by adding a line 0.01" thick to the line for grades. This will give a total thickness of 0.02".

Ascending grades will be spotted above the line; descending ones below. The percent of each ascending grade will be shown above the line, preceded by a plus sign; each descending grade below the line, preceded by a minus sign, except where there is not sufficient room, in which case they may be entered on the opposite side of the line.

In general, the following criteria will be used to determine which grades to show:

- 3% thru 4%, not less than 1000' long
- 4.1% thru 5%, not less than 500' long
- 5.1% thru 7%, not less than 300' long
- 7.1% and over, not less than 200' long

Exceptions will occur regarding shorter durations of grade that connect sections which qualify under the above rules. For example, a -7% grade, 350 ft. long, is shown on the construction profile as changing into a -4% for a distance of 400 ft., and then into a -8% for 500 ft.. Normally, a 400 ft. 4% grade would not be shown, but in this case it connects the 7% and the 8%, so will be shown.

Grades under 7% occurring consecutively for a distance of two-tenths of a mile or more will be averaged between the beginning and end of the section. The average will be determined from the total rise (or drop) and the total horizontal distance. For example, a rise of 50 ft. in a horizontal distance of 500 ft. would result in an average grade of \neq 10%. All figures indicating average grades will be followed by the letter "A", for example \neq 10A. The style of lettering will be vertical free-hand as large as space permits.

VII TRAFFIC

Figures for 24-hour annual average traffic volumes will be shown along the lines for "traffic". The figures shown (100-0-VC Leroy) will apply to the sections between arrowheads, which in general are at town and city lines, important road intersections, etc.

The date of the traffic data will be entered at the left of the line on which the figures appear.

VIII MILEAGE

The mileage of each existing surface type will be compiled and listed in its proper location in the mileage block. The blank symbol space at the left of the mileage block is provided for surfaces that do not occur frequently. Granite block is an example and where it occurs the appropriate symbol will be added and labeled. Mileage will be listed by system and surface type.

For villages incorporated for highways and for urban compacts the town and village mileage will be tabulated separately on the log of the town. The summary total will include the village mileage. The date below the mileage total indicates the year to which the mileage is correct. Subsequent mileage changes will be dated January of the year following that in which the change occurred. The previous mileages will be entered in the blank line to the left of the date line, e.g. - 1.250 - 1950.

IX SHEET NUMBERS

Sheet numbers appear in the lower right corner, e.g. 1/3, 2/3, 3/3. The first number refers to the sheet number, the last to the total number of sheets for the route. When more than one sheet is necessary for a town, the sheets will be numbered consecutively. The first will be marked "1 of 2 sheets" and the second "2 of 2 sheets" in the margin below the regular sheet number.

X LEROY LETTERING STANDARDS

| <u>FEATURE</u> | <u>TEMPLATE NO.</u> | <u>LETTERING</u> | <u>PEN SIZE</u> |
|-----------------------|---------------------------------------|------------------|-----------------|
| Title | 175 | Vertical Caps | 2 |
| FAP, FAS and FAU | 120 | Vertical Caps | 0 |
| Project Years | 175 | Vertical Caps | 2 |
| State Aid Boxes | "A" for box 100 for number | Vertical Caps | 00 |
| State Highway Circles | 0.30" dia. circle 120 for number | Vertical | 0 |
| U.S. Numbered Route | "A" for 0.3" shield 120 for number | Vertical | 00 |
| Village & City Names | 100 | Slanting Caps | 0 |
| Population Figures | 80 | Slanting Caps | 00 |
| Mileage Tabulations | 120 | Vertical Caps | 0 |
| Mileage Date | 120 | Vertical Caps | 0 |
| Town & County Names | 140 | Vertical Caps | 1 |
| End of State Highway | 120 | Vertical Caps | 0 |
| Sheet Number | 175 | Vertical Caps | 2 |
| "1 of 2 sheets" | 120 | Vertical Caps | 0 |

ROUTE LOG AND PROGRESS CHART STANDARDS

The route log and progress chart is a straight line diagram of the highway and its physical characteristics, and a progress chart and maintenance record of the surface types. It is divided properly into three parts.

1. Top - Construction, maintenance and progress chart of surface types
2. Center - Diagram of highways, railways and waterways
3. Bottom - Diagram of accidents, topographical characteristics and traffic

CONSTRUCTION, MAINTENANCE AND PROGRESS CHART

The purpose of this chart is to show a graphical record of the progress of construction, reconstruction and maintenance for each section of the highway system. The chart is divided into 13 spaces, the top space of which is reserved for the type of surface existing as of January 1st of each year. This is in order that the existing surface in the entire town may be obtained at a glance.

Construction projects will be progressive from bottom to top, that is, the earliest projects will be indicated at the bottom and successive maintenance by year will be shown above, followed by reconstruction when it occurs.

The following information will be shown:

1. Construction

- Year Constructed
- Project Number
- Length of Project
- Surface type (by symbol) with necessary description and depth
- Surface Width
- Shoulder Width
- Sub-base Depth
- Right of Way, if practical

2. Maintenance

Maintenance will be shown successively above the construction as it occurs. The type of information to be shown by symbol as follows:

Year
Length (by scale)
Aggregate
Type of Bit. material

DIAGRAM OF HIGHWAYS, RAILWAYS AND WATERWAYS

Features to be shown by station and miles

1. All intersecting Public Highways by number and destination if destination is clearly evident.
 - A. Town highway numbers are indicated by T prefixed to the number which will be obtained from the town maps. The diagram will be checked with the town maps and all public traveled highways shown on the map will be shown on the diagram. Where speedometer measurements are used, a sign will follow the stationing.
 - B. State Aid highway numbers will be obtained from the town maps. If a Vt. Route No. has been assigned to the highway, this number will be shown in preference to the selected number. State Aid connecting links will be indicated by narrowing the existing band to 0.10".
 - C. State highways are indicated by the State number.

2. Corporate Lines

The unit of control will be the town and town lines which will be indicated at the beginning and ending of each sheet, exclusive of towns that require two sheets, or routes which begin at the intersection of another route. The stationing will start at zero at each town line and at route intersections.

- A. Town Lines
- B. City Lines
- C. State Lines
- D. Village Lines
- E. Urban compact Lines

3. Structures

All structures of 3' clear span and over which bridge or go under the highway will be shown.

- A. Bridges, boxes, culverts, penstocks, tunnels, pipes, overpasses, underpasses and cattlepasses.
- B. Each structure will show the following information:
 - 1. Name of river, railroad or highway
 - 2. Type of structure
 - 3. Type of rail
 - 4. Project number and year
 - 5. Span, number, clear and overall
 - 6. Clear height
 - 7. Roading width
 - 8. Traffic clearance
 - 9. Loading
 - 10. Number

All structures of 4' span and over will be numbered by routes, starting at the beginning of each route.

4. Population and Villages

All villages and cities will be shown by a circle indicating the center and the name of the villages shall be indicated adjacent to the center. The corporate lines will be shown each side of the center and that section of the village will be emphasized by commercial shading with non-wax base. The population will be shown in conjunction with the name.

DIAGRAM OF ACCIDENTS, TOPOGRAPHICAL CHARACTERISTICS AND TRAFFIC

Accidents

Accidents will be spotted by means of a circle on the center line, the month, and the last two digits of the year. An open circle indicates a non-fatal accident and a closed circle indicates a fatal accident.

(At the present time accidents are not located close enough in the field to be shown on the chart.)

Topographical Characteristics

Curvature

All curves of 5% and over will be shown. They will be indicated by means of a curved line on the center line. Curves to

the left being shown above the line and curves to the right below the line with the number of degrees indicated.

Sight Distance

All restricted sight distances of less than 1000 feet will be shown by means of an open block drawn to scale. The type will be indicated as follows:

H = Horizontal 300'

V = Vertical 500'

Grades

All grades of 6% and over will be shown by a heavy block drawn to scale where possible with the grade and length indicated.

Traffic

The traffic diagram will reflect the traffic in 5 to 10 year periods or whenever major changes occur.

The source document is from the files of the Vermont Agency of Transportation Mapping Unit, Montpelier, Vermont.

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