METHOD OF CONDUCTING A STATE-WIDE
HIGHWAY PLANNING SURVEY

A Thesis
Submitted for the Degree of
CIVIL ENGINEER

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PART I

THE NECESSITY OF HIGHWAY PLANNING
The Necessity of Highway Planning

The growth of highways in the United States is comparable in many respects to the growth of a fruit tree which a man planted originally for the pleasure of just being the possessor of a tree. The movement for the building of roads was started about twenty years ago by the incentive of having good roads on which to go for a ride somewhere outside of town for an outing, either by horse or bicycle or by that rare and rather terrifying invention, the automobile. The roads at this time were built largely for pleasure or through jealousy aroused by the fact that neighboring towns or counties had better roads. These roads seemed to be quite self-sufficient, in that they rarely had any connection with each other, and were quite indifferent, in that they never attempted to go very far nor have any specific reason for going at all. The roads, like the tree, were permitted to grow of their own volition, prompted occasionally by spurts of enthusiasm through contributions of either tax money or direct labor.

Building of roads for pleasure continued through the first decade of 1900, but there were a few men of vision who saw that if the tree were to grow in strength and bear fruit, some attention must be given to it. The trunk and the main branches must be strengthened, and so was started the movement for the establishment of the Federal Bureau of Roads and the various State Highway Departments. These leaders realized that main highways connecting cities and states must be constructed to foster the support and growth of feeder roads in the same manner that the trunk and main branches of a tree foster the support
and growth of the smaller fruit-bearing branches.

Construction of roads was financed in the beginning through property taxation, but as automobiles increased in number, taxation was placed directly upon the owner through the medium of a license and a gasoline tax. The proceeds derived from these latter sources have increased far beyond conception so that today our highways are supported in whole by the direct taxation derived through automobile ownership. This continual and increasing flow of revenue, contributed in part by the Federal Government and in part by the respective states, has made it possible to construct a national highway system which makes it feasible for us to travel throughout the nation in any direction over improved roads.

We have today approximately 330,000 miles of roads under the Federal and State Systems classed as primary roads, but many of these roads are far from satisfactory. A great number of these roads were not designed to sustain the deteriorating impact to which they are subjected due to an ever increasing flow of traffic and an ever growing movement of heavily loaded trucks and busses, nor were they designed with respect to width, alignment and grade to provide for the ever increasing speed at which the automobile of today travels. All of these factors, which fail to co-relate existing road conditions with modern traffic conditions, must be corrected and improvements projected in order to revise these obsolete conditions.

There remains another type of road which far exceeds in mileage the State and Federal roads; namely, the secondary roads throughout the nation which are estimated to aggregate some 2,700,000 miles. Heretofore, these secondary roads received no
consideration except at the hands of local authorities in their respective counties, and while a goodly portion of these roads has been improved to some extent, the major portion has received little or no attention. As each year brings nearer to completion the paving of main routes, and as there seems to be no abatement of income for road building purposes, there is a growing tendency on the part of the people to do something with the secondary roads. This movement towards improvement of secondary roads has increased in importance to the extent that the Federal Bureau of Roads now allocates a specified percentage of funds for their construction and in most states a separate department has been set up under the aegis of the Bureau to prosecute this work.

We stand today at the cross roads of highway construction, The way back cannot be retraced, we must go forward. We can arrive at our destination by going to the right and continuing improvement of the main routes or by going to the left and constructing only such secondary roads as may be demanded for selfish reasons. These two routes may offer the least resistance, but they are, by far, the longest and the costliest. The other way open to us is straight ahead by means of intelligent planning. We will encounter difficulties here because of factional jealousy, but certainly our destination will be reached with a saving of both time and money.

Our problem is not one of how many miles of roads we can build, nor of how many miles we can maintain, but one of how many miles of roads we are willing to own. The increasing demand for improvement of secondary roads, as well as revision of the present primary roads, will create an excessive strain upon
our financial resources. Unless we approach the subject of future highway construction by means of a scientific analysis of the entire highway transportation problem, we will have a structure resting upon the shifting sands of public opinion, which will require constant shoring and bracing at great expense if we are to build upward.

There is another important factor which heretofore has been given no consideration whatsoever in the field of highway construction, but which may become one of the predominating problems to contend with. This problem, which may transcend present day factors, is that of redistribution of population. Communities, in the past, were established in a somewhat concentrated pattern, brought about by the attractive forces of water and rail transportation supplemented by steam power; whereas, in the future, new communities may and probably will be established in a diffused pattern actuated by the repellent force of a more flexible motor vehicle transportation supplemented by an equally facile electrical power. We have already seen this factor taking growth in the dispersement of industry from the highly centralized plants to widely scattered branch units, in the decadence of once prosperous river and railroad towns, and in the compulsory abandonment of non-productive farming sections. We cannot ignore this possible readjustment of population entirely in planning highways of the future; because, if we do, we may invest money in roads which in years to come may have no justifiable reason for existing.
Ford Across Creek

Practically Impassable by Automobile
PART II

THE PURPOSE OF A HIGHWAY PLANNING SURVEY
The Purpose of a Highway Planning Survey

A Highway Planning Survey serves the same purpose to the road builder, and the public at large, that a diagnosis and a case history of a patient serves the attending physician. The purpose of a Highway Planning Survey can best be explained by taking each phase of the Survey, and detailing the specific purpose of that one division, and then consolidating this information into a unified statement apropos of the Survey as a unified problem.

The purpose of the Road Inventory is to secure all pertinent data pertaining to every publicly traveled road in the state. This data will be made up of such information as the location, length, width, material, condition and drainage facilities on each road; the location, type, load bearing capacity, safety of approach and condition of bridges; the location, visibility, safety condition and accident record of all railroad crossings; the location of all houses, farms, schools, churches, business establishments, industries, railroads, navigable streams, airports, and local road building material deposits, on or near each road; the terrain and the types of soil in every section traversed by each road.

Data acquired, as a result of a state-wide Traffic Survey, will make it possible to segregate all roads as to their relative traffic-carrying importance. This information will consist of density counts on key circuits, where traffic will be tabulated by the hour and classified as to passenger cars, trucks and busses, both local and foreign; the direction from which these vehicles came and in which they are going. Weight data of
trucks and busses will also be secured at designated points, whereby will be determined the type, weight, width, length, height, load capacity, load carried, commodity carried, place of ownership, origin, destination and trip mileage for every truck and bus that is stopped and weighed. Blanket counts at numerous county road intersections will supply information as to secondary road traffic. Origin and destination studies will provide a comprehensive history of individual travel for a statewide average. Automatic electric counters will supply a continuous picture of traffic flow over selected primary and secondary roads.

The Financial phase of the Survey will disclose what portion of taxes has been, and is being, expended for the construction of roads, Federal, State, and County; how much is allocated for city streets; what percentage of the tax dollar goes towards this type of public expenditure; what proportion is paid by the urban populace and by the rural populace; what part of this burden falls upon the automobile owner and the non-owner; and to what extent highway expenses are borne by commercial users of the highways, as compared to the private individuals.

The purpose of the Road Life Study is to compile data on all types of construction and under varied traffic conditions; in order that, in the future, the life expectancy of each type of road may be brought under a practical formula, in somewhat the same manner that is employed by insurance companies in formulating the life expectancy of individuals. Research work on this phase will cover the entire history of the roads on record throughout their period of existence, from the grading to the surfacing, and on through maintenance.
Final compilation of all of this information will give us the only comprehensive picture of highway history to date. It will, for the first time, tell us how many miles of roads we have; what type they are and the nature of the territory they serve; it will provide us with complete information as to the amount and kind of traffic our roads carry; it will enlighten us as to the cost of roads and the distribution of these costs, which heretofore has been a problem of crystallogomancy; it will inform us concerning the life expectancy of all types of roads; it will enable us to plan our future mode of existence from a geographic standpoint; and finally, it will greatly assist us in unravelling the very vexing problem of a national transportation system, which yearly is becoming so complex that it seriously affects our entire economic structure.
Dangerous Two Lane Underpass on Federal Route

Constructed on Point of Reverse Curve
PART III

ROAD INVENTORY
Road Inventory

Field Work

General

Inventory of roads shall be performed by a party consisting of a chief of party, recorder, chainman, and a field draftsman. The equipment necessary to prosecute the field work shall consist of the following:

- Automobile (Sedan or Coach equipped with odometer)
- Tire Gauge
- Forestry Compass
- Plumb Bob
- Hand Level
- 50' Metallic Tape
- 100' Steel Tape
- 6' Folding Rule
- Drawing Board (21" x 26"
- Clip Board (9" x 13 1/2"
- Clip Board (18" x 24"
- Two Binders (18" x 24"
- 10' Painted Rod (3/4" x 2"
- Tack Hammer
- Short Handled Mattock
- Inventory Tags
- Box Letter File
- Two Red Flags
- Portable Drawing Table
- 6" and 12" Engineer's Scale
- Two 8" Triangles (30 - 60°)
Two 10" Triangles (45)
6" and 8" Protractors
36" T Square
Stationery Supplies
Forms HPS - 1, 4, 5, 6, 8, and 200
Standard Field Tables (General Land Office)
Map of County to be Inventoried
Descriptive Data of U.S.C. & G.S. Triangulation Stations of County to be Inventoried

The party shall establish headquarters at the county seat in order that county officials may be questioned regarding information which may not be available in the field. The party chief shall then interview the county commissioner, county school superintendent, county warden, postmasters and other officials who may have road information of value to the party. Before beginning work, the chief of party shall familiarize himself with the county map and lay out inventory zones. These zones shall be bounded by definitely established features, such as state routes, major county roads, rivers or railroads. All roads shall be assigned a number, but only as they are inventoried with the exception of state routes which shall carry the number assigned to it by the state.

Odometer

The odometer shall be checked for accuracy before starting work in each county, each time the tires are changed, and on other occasions when doubt may arise as to any variation of reading. This shall be done by making a test run over a chained or known distance of five miles or more. If the odometer
distance varies more than two percent from the known distance, the tire pressure shall be changed until the odometer records the distance to the desired accuracy. A permanent record of this test run shall be made on Form HPS-200 (see sample form). The tires shall be checked each morning before beginning work and the same pressure maintained throughout the inventory in that county.

**Triangulation and Traverse Stations**

Description of the location of all triangulation stations, first order traverse stations, and local control stations will be furnished the chief of party. These stations shall be tied into the road, on or near which they are situated, by odometer reading, distance, and bearing.

**Federal and State Projects**

All Federal and State Aid Project markers shall be located on their respective roads by odometer reading, indicating the number and direction of the project.

**Cities and Towns**

All cities, towns and villages shall be located on roads which extend to, or through their limits. Odometer readings shall be taken at all corporate limits. The city center and the geographic center shall also be located in each case; the former being that point from which mileage is generally measured by the public, such as the court house, city hall and railroad station. Cities, towns and villages shall be listed according to the following classification:

1. Incorporated Postoffice Railroad
2. Unincorporated Postoffice Railroad
3. Incorporated Postoffice No railroad
4. Unincorporated Postoffice No railroad
5. Incorporated No postoffice Railroad
6. Unincorporated No postoffice Railroad
7. Incorporated No postoffice No railroad
8. Unincorporated No postoffice No railroad

A complete inventory shall be made of all roads and streets in all unincorporated towns. Cultural items along roads through incorporated towns shall not be inventoried, but items common to all towns such as curb and gutter, sidewalks, names of streets traversed, railroad station, city and geographic center, shall be recorded. Roads and streets through sub-divisions and private mill villages which are open to public use shall be inventoried as in unincorporated towns.

Reservations

Roads through public reservations shall be inventoried and the boundaries indicated by odometer reading on each road. These reservations shall be classified as follows:

National Forest
National Forest Development
Military
Indian
Other National Reservation (kind)
State Forest
State Park
Other State Reservation (kind)
Typical Important County Road
Insufficiently Maintained
Roads

The alignment of all roads shall be established by compass bearings to full degrees and the length by odometer readings to the hundredths of a mile. The point of intersection of all curves shall be located by odometer readings and the direction of curvature by tangent bearings. All roads shall be tied into each other by odometer equalities, bearings, and road numbers by the use of inventory tags (see sample tags), and these tags shall be tacked to a tree or other object at each intersection so that the information can be readily obtained as each new road is inventoried. All roads maintained at public expense over which a four wheeled vehicle can travel shall be logged, and if they are impassable for automobile travel, they shall be measured with a hundred foot steel tape. Inventory of toll roads shall include the name of the owner, the name and address of the principal officer, and a schedule of the toll rates.

All data pertaining to road inventory shall be recorded on Form HPS-6 (see sample form). The center line of this form, which represents the road, is divided into tenths of a mile in order to facilitate the recording of odometer readings. Alignment data, bridges, railroad crossings, road intersections, city, county, section, and state lines, and such items as relate directly to the road proper shall be sketched on this center line. Special data required for bridges and railroad crossings shall be recorded on separate forms as explained in a separate succeeding section.

Cultural items shall be recorded with respect to odometer reading and distance from the center line in their proper location on Form HPS-6 (see sample form), using the symbols listed
under a separate section. All power and telephone lines, railroads, and streams shall be sketched on this form whenever they come within the line of vision of the inventory party even though they do not cross the road.

Classification of roads shall be listed in classification spaces one to five by the use of symbols as explained under a separate section. Traffic conditions on each road, as observed by the inventory party, shall be noted under remarks at the bottom of the straight line form.

Culverts

Drainage structures with a clear span of from 10 feet to 19 feet, measured along the center line of the road, shall be recorded on Form HPS-6 by odometer reading and shall be described as follows:

1. Type and material
2. Length
3. Width
4. Height (stream bed to floor or road surface)
5. Condition
6. Name of stream
7. Direction of stream flow

Bridges - General

All bridges with a clear span of 20 feet or more, measured along the center line of the road, shall be recorded on Form HPS-6 (see sample form) by odometer reading at the beginning of the structure. The name of the stream and the direction of flow shall also be indicated. Complete description of the bridge shall also be recorded on Form HPS-5 (see sample form) as follows:
Covered Bridge Resting on Solid Rock

This Type of Bridge Practically Extinct
1. Odometer reading at beginning of structure
2. Name of stream, highway or railroad
3. Kind of crossing, if over or under railroad
4. Load limit (posted or calculated)
5. Construction date
6. Overall length of bridge along center line of road
7. Clear span or spans
8. Type of substructure for each span, whether piers, abutments, pile or frame bents, or columns, and the kind of material
9. Type of superstructure for each span, whether truss (name), girder (beam or stringer), integral slab and beam, slab, arch, suspension, cantilever, or covered, and the kind of material
10. Kind of material in floor
11. Highwater mark above or below bridge floor
12. Rip rap, kind and location
13. Condition of substructure, superstructure, and floor, whether good, fair, or poor, and description of serious defects
14. Condition of paint
15. Minimum lateral roadway clearance between curbs, railings, or bridge members
16. Sidewalks, side and width
17. Distance from road surface to stream bed or top of rail
18. Distance from road surface to bottom of portal
19. Clear distance of opening above stream bed
20. Remarks as to adequacy of the opening, and as to location
of the bridge with respect to alignment and grade of the approaches

**Draw Bridges**

The spans on draw bridges shall be described according to the following classifications:

1. Bascule - single leaf (hand or power operated)
2. Bascule - double leaf (hand or power operated)
3. Vertical lift (hand or power operated)
4. Rotary (hand or power operated)

The type of protection at all draw bridges shall also be described, using the same classification, listed on Form HPS-1 (see sample form), as is used for railroad crossings.

**Toll Bridges**

Additional information shall be obtained on all toll bridges as follows:

1. Name of owner
2. Name and address of principal officer
3. Schedule of toll rates

**Ferries**

The following information shall be secured on all ferries as they are encountered on road inventory:

1. Name of river
2. Estimated width of stream at low water
3. Capacity of boat (passenger automobiles)
4. Motive power (hand or power)
5. Number of scheduled round trips in 24 hours
6. Hours of service each day
7. Whether toll or free
8. Type of protection (see Form HPS-4 for classification)
Railroad Crossing on County Road

Visibility Completely Obstructed in Both Directions
9. Name of owner and name and address of principal officer

10. Schedule of toll rates

**Railroad Crossings**

All railroad crossings shall be located by odometer reading on Form HPS-6 (see sample form), but a complete description of each crossing shall be made out on Form HPS-4 (see sample form). The data to be secured shall consist of the following:

1. Odometer reading at crossing
2. Name of railroad
3. Number of nearest mile post and distance from crossing
4. Number of main line and other tracks
5. Approximate gradient of road approaches
6. Angle of crossing
7. Alignment of railroad (tangent or curve)
8. Clear view distance
9. Types of protection

Sight distances at points 300 feet from the crossing shall be noted and all sight distances over 2000 feet, as measured along the railroad, shall be considered as unlimited. The view may be greatly restricted at the 300 foot point, but may become unlimited at a point closer to the crossing. If such a condition exists, the point of greatest sight distance shall be located, and any obstructions noted on the form, giving the distance of these obstructions from the road and the railroad.

**Cultural Items with Symbols**

All cultural items shall be inventoried along each road, indicating by means of a small square on Form HPS-6 (see sample form) the location with respect to the road. The following
symbols shall be used in conjunction with the small square to designate the kind of item inventoried.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>AP</td>
<td>Airport</td>
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<tr>
<td>BL</td>
<td>Airway Beacon Light</td>
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<tr>
<td>CA</td>
<td>Community Auditorium</td>
</tr>
<tr>
<td>BP</td>
<td>Ball Park</td>
</tr>
<tr>
<td>Barn</td>
<td>Without Dwelling</td>
</tr>
<tr>
<td>B</td>
<td>Business (without residence - kind)</td>
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<tr>
<td>BH</td>
<td>Business and Home Combined</td>
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<tr>
<td>CG</td>
<td>Cattle Guard</td>
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<tr>
<td>CP</td>
<td>Cattle Pass</td>
</tr>
<tr>
<td>Cem.</td>
<td>Cemetery</td>
</tr>
<tr>
<td>C</td>
<td>Church</td>
</tr>
<tr>
<td>CG</td>
<td>Cotton Gin</td>
</tr>
<tr>
<td>CH</td>
<td>Court House</td>
</tr>
<tr>
<td>D</td>
<td>Dairy</td>
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<tr>
<td>H</td>
<td>Dwelling</td>
</tr>
<tr>
<td>FG</td>
<td>Fair Grounds</td>
</tr>
<tr>
<td>F-1</td>
<td>Farm Unit (2 or more houses). Plantation, estate or farm with central dwelling and tenant dwellings on the farm.</td>
</tr>
<tr>
<td>F-2</td>
<td>Farm Unit (1st Class). Dwelling with moderate or large sized barn and outbuildings. A place whose general appearance indicates any phase of agriculture as the principal business.</td>
</tr>
<tr>
<td>F-3</td>
<td>Farm Unit (2nd Class). Rural dwelling with small acreage, generally less than five acres, with few outbuildings; appearances indicating the occupant earns living elsewhere.</td>
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FS  Filling Station
FT  Fire Tower
FL  Fishing Lodge
GG  Golf Grounds
GP  Gravel Pit
I   Industry (kind)
L   Lake (name)
LRM Local Deposit Road Material
LC  Logging Camp
M   Mine (kind)
PO  Postoffice
PP  Public Park
RS  Railroad Station
RH  Resort Hotel
SM  Saw Mill
SP  Scenic Point
S   School
TH  Tenant House
TC  Tourist Camp
TS  Turpentine Still
V   Prefix for Vacant Property
       Power Lines
       Transmission Lines
       Telephone and Telegraph Lines
△  Triangulation Station (number)
BM  Bench Mark (number and elevation)
   Guard Rail
Road Classification

All roads shall be classified in spaces one to five on Form HPS-6 (see sample form), and the limits of each classification shall be indicated by arrows. This classification shall conform to the following types and shall be recorded by the numbers assigned to each type.

Space one shall be used to designate the type of grading, the type of surfacing, and the type of base. Sidewalks and curb and gutter shall also be designated in this space when a road continues through a city or town.

Types of Grading:
1. Primitive Road
2. Unimproved Road
3. Graded and Drained Road (Low Type)
4. Graded and Drained Road (Intermediate Type)
5. Graded and Drained Road (High Type)

Types of Surfacing:
10. Soil Surfaced Road
   11. Natural Sand Clay or Top Soil
   12. Sand Clay or Top Soil (\(\frac{1}{3}\)" or -3" thickness)
   13. Quarry Waste (size less than \(\frac{1}{4}\) inch)
   14. Sand Clay stabilized with Calcium Chloride
   15. Subgrade stabilized with Bituminous Material
   19. Other Types
20. Gravel or Stone Road (coarser than sand)
   21. Chert (\(\frac{1}{3}\)" or -3")
   22. Clay Gravel (\(\frac{1}{3}\)" or -3")
   23. Crushed Stone (\(\frac{1}{3}\)" or -3")
24. Disintegrated Rock (¾" or -¾")
25. Pebble Soil (¾" or -¾")
26. Shell (¾" or -¾")
27. Slag (¾" or -¾")
29. Other Types
30. Bituminous Surface Treated (1" or less in thickness)
   31. Single Surface Treatment - Slag
   32. Single Surface Treatment - Stone
   33. Double Surface Treatment - Slag
   34. Double Surface Treatment - Stone
   35. Double Surface Treatment - Slag and Stone
   36. Rock Asphalt
   39. Other Types (kind)
40. Mixed Bituminous Road (over 1" in thickness)
   41. Road Mix in Place - Sand
   42. Road Mix in Place - Gravel
   43. Road Mix in Place - Stone
   44. Road Mix in Place - Slag
   49. Other Types (kind)
50. Bituminous Penetration Road (over 1" in thickness)
   51. Penetration - Stone
   52. Penetration - Gravel
   53. Penetration - Slag
   59. Other types (kind)
60. Bituminous Concrete or Sheet Asphalt Road (over 1" in thickness)
   61. Bituminous Concrete
   62. Limerock Asphalt
63. Sand Asphalt or Sand Asphalt Base
64. Sandrock Asphalt
65. Sheet Asphalt
69. Other types (kind)

70. Concrete Road
   71. With expansion joints at regular intervals, no center longitudinal joint
   72. With expansion joints at regular intervals and center longitudinal joint
   73. Without regularly spaced expansion joints
   74. Cement Bound Macadam
   75. Vibrolithic Concrete
   76. Concrete Road with Bituminous Surface not less than one inch thick
   79. Other types (kind)

80. Brick Road
   81. With Bituminous Filler
   82. With Cement Grout Filler
   83. With Bituminous Mat less than 1" thick
   84. Other types (kind)

90. Block Road
   91. Asphalt Block
   92. Stone Block
   93. Wood Block
   94. Block Road with Bituminous Mat less than 1" thick
   99. Other types (kind)

Types of Base:
   1. Bituminous Concrete
   2. Bituminous Macadam
3. Chert
4. Clay Gravel
5. Concrete
6. Crushed Rock
7. Limerock
8. Pebble Soil
9. Sand Clay or Top Soil
10. Shell
11. Other types (kind)

N - Sidewalks (show side and distance from center line)
O - Curb and Gutter (show side and distance from center line)

Space two shall be used to describe the general condition, the defects if any, and the drainage of the road.

Condition:
C-1 Good
C-2 Fair
C-3 Bad

Defects:
D-1 Not serious
D-2 Corrugated
D-3 Scaled
D-4 Raveled
D-5 Warped
D-6 Badly Cracked
D-7 Disintegrated
D-8 Soft Spots
D-9 Rutted
Well Maintained Secondary Road
Graded and Drained and Gravel Surfaced
Drainage:

Side Ditches
1. None
2. Incomplete
3. Complete

Cross Drains
4. None
5. Incomplete
6. Complete

Space three shall be used to designate the width order of the road, the types of soil and the topography of the section through which the road extends.

Width Order:

Surface
Roadbed (paving plus shoulders)

Right of Way

Type of Soil:
S-1 Sand
S-2 Sand Clay
S-3 Pebble Soil
S-4 Clay
S-5 Rocky

Topography:
T-1 Flat
T-2 Rolling
T-3 Hilly
T-4 Mountainous
Space four shall be used to describe the administrative system under which the road is maintained and to designate the use of the road according to route. School bus routes shall be verified by the county school superintendent and mail routes by the postmasters.

Administrative System:

- SR State System (rural)
- SM State System (municipal)
- SF State Forest
- SP State Park
- SI State Institution
- CR County System (rural)
- FF Federal Forest
- FP Federal Park
- FM Federal Military

Routes:

- SB School Bus
- CB Common Carrier (bus)
- CT Common Carrier (truck)
- RFD Rural Free Delivery Route
- SMR Star Mail Route

Space five shall be used for any additional descriptive information of the road.
# Daily Time and Work Report of Road Inventory Party

**NAME**  
Party Chief: A. H. Stephens  
Recorder: G. A. Nellie  
Draftsman: None  
Chainman: None

<table>
<thead>
<tr>
<th>District</th>
<th>Date</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 4, 1931</td>
<td>8</td>
</tr>
</tbody>
</table>

**County:** Chattooga  
**Zone:** South West  
(Show Section of County)

**ODOMETER READINGS**

| From Hdqts | Time of Day | Hours Field Work | Hours Lost in Field | Hours Misc. Work | Remarks: (Explain in complete detail on back of this section)
|------------|-------------|------------------|--------------------|-----------------|------------------------------------------------------------------------
| 37629      | 7:45 AM     | 8                | 0                  | 1               | Misc. Time; Time Lost; Slow Progress; Excellent Travel
| 37635      | 8:00 AM     |                  |                    |                 |                                                                         
| 37683      | 4:30 PM     |                  |                    |                 |                                                                         
| 37691      | 4:45 PM     |                  |                    |                 |                                                                         

**Total Miles Traveled:** 62  
**Travel Per Mile inventoried:** 2.36

## Record of Roads Inventoryed

<table>
<thead>
<tr>
<th>Road Number</th>
<th>From</th>
<th>To</th>
<th>Miles Inventoried (Nearest tenth)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>35.42</td>
<td>40.04</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>42.71</td>
<td>46.30</td>
<td>3.6</td>
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</tr>
<tr>
<td>29</td>
<td>48.07</td>
<td>52.37</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>54.84</td>
<td>55.19</td>
<td>0.4</td>
<td></td>
</tr>
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</tr>
<tr>
<td>32</td>
<td>64.38</td>
<td>64.93</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>67.47</td>
<td>72.75</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>80.17</td>
<td>83.24</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>

**Total or Sub-Total:** 26.2

Route to follow to arrive at first road to be inventoried next day and probable roads to be inventoried next. (Give numbers of principal roads; use back of form if necessary.)

Go west on Ga. #48 approximately 3 miles west of junction with Ga. #114. Will start on this road and run south.

Res. Address: City | Summerville  
Street | 14 Main Street  
Phone Number | None  
Office Address | Same  
Location Sketch at | Same  
I Certify that this Report is Correct. A. H. Stephens (Chief of Party)

Original, Atlanta Office; Duplicate, District Supervisor; Triplicate, Chief of Party.
## RECORD OF ROADS INVENTORIED

<table>
<thead>
<tr>
<th>Road Number</th>
<th>From</th>
<th>To</th>
<th>Miles inventoried</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Nearest tenth)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

**Reasons for slow progress:**

- 6 Special Bridge Sheets
- 3 Railroad Crossing Sheets
- 210 PI's located
- 35 Bridges between 10' and 20'

One half hour lost due to inspection visit of District Supervisor.

Roads slowly drying out, in somewhat better condition.

One hour at night devoted to making up Form HPS-6 and laying out the next day's work.
STATE HIGHWAY BOARD OF GEORGIA
DIVISION OF HIGHWAY PLANNING SURVEY
In Cooperation With United States Bureau of Public Roads
RAILROAD GRADE CROSSING SHEET

Name of Railroad: Central of Georgia
Number of Nearest R.R. Mile Post and Direction from Crossing: 2-40 200 7-4
Number of Main Line Tracks: 1
Number of Other Tracks: 0
Road Approaches to R.R. Crossing:
Approximate Gradient (+) or (—)
M = —1 % N
N = 200 % N Length
L = —2 % 100 % 0 Length
0 = — % 300 % —4 % P Length
P = —4 % Q Length

Houses

SHOW BREAKS IN GRADIENTS AND LENGTH OF GRADES NEAR CROSSING.
("N 0" "O P")

CHECK TYPE OF PROTECTION
0. No Warning Signal
X. 1. Signs Only
. 2. Bells
. 3. Lights Stationary
. 4. Lights Flashing
. 5. Lights and Bells
. 6. Wigwag
. 7. Wigwag & Lights
. 8. Wigwag & Bells
. 9. Wigwag, Lights & Bells

Watchman Hours on Duty

<table>
<thead>
<tr>
<th>From Manual</th>
<th>To Automatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gates</td>
<td></td>
</tr>
<tr>
<td>Barriers</td>
<td></td>
</tr>
<tr>
<td>Chain or Cable</td>
<td></td>
</tr>
<tr>
<td>Other Protective Devices</td>
<td></td>
</tr>
</tbody>
</table>

Houses

NOTE
Record between arrows on sketch the approximate distances along highway center line representing the views from points “N” and “P” respectively. If the view along the track is 200 feet or more record same as unlimited.
Indicate points of greatest sight distance as follows:
(1) Approaching track in direction of survey.
Between “N” and clearance of nearest mile track.
Looking to right:
Greatest sight distance along railroad 20
Distance, point of observation to center of crossing (point “O”) 20
Looking to left:
Greatest sight distance along railroad 20
Distance, point of observation to “O” 20
(2) In reverse direction beyond crossing.
Between “P” and clearance of nearest mile track.
Looking to right:
Greatest sight distance along railroad 20
Distance, point of observation to “O” 20
Looking to left:
Greatest sight distance along railroad 20
Distance, point of observation to “O” 20
Clearance point may be considered as 15 ft measured from driver’s position in car to center of track.

Make sketches and note all obstructing objects showing distance from railroad and highway. Where this layout is not suitable for sketching, use back of form.
STATE HIGHWAY BOARD OF GEORGIA  
DIVISION OF HIGHWAY PLANNING SURVEY  
In Cooperation With U. S. BUREAU OF PUBLIC ROADS  

BRIDGE SHEET — ROAD INVENTORY  
(See Note 2)  

Odometer Reading 76.15  
Name of Pettit Creek  
(Highway, Stream or Railroad)  

Kind of Crossing (Note 1):  
Underpass—Simple RR No.  
Underpass—Combined RR No.  

Calculated Load Limit 20 T  
: Posted Load Limit None  
: Bridge No. None  

Overall Length of Bridge Along Center Line of Roadway 120  
Construction Date: Unknown  

**TYPE AND KIND OF MATERIAL**  

| SPANS |  
| --- | --- | --- |  
| No. | (Note 3) Length | SUBSTRUCTURE | SUPERSTRUCTURE | FLOOR |  
| 1 | 115 1/2' | Abutments Concrete | Pratt Truss Steel Oak Plank |  

For Culverts and Arches—See Note 8.  

Highwater Mark Ft. Above or 4 Ft. Below Bridge Floor  
Rip Rap; Give kind and location: None  

General Condition of Bridge: Check if Good, Fair, or Poor;  
Describe defects if serious.  

<table>
<thead>
<tr>
<th></th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superstructure</td>
<td>X</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Floor</td>
<td>□</td>
<td>X</td>
<td>□</td>
</tr>
<tr>
<td>Substructure</td>
<td>X</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

Paint: Good X, Fair, Poor, Badly corroded or rusted  

Clearances: Roadway (Note 5) 16; Sidewalk widths: Right None, Left None; Surface of Road to Stream Bed 18 (If overpass, show distance to top of rail); Surface of Road to bottom of Portal 14 1/2  
(Minimum overhead clearance); Clear distance of opening above stream bed 16 1/2' (Waterways only).  

Remarks: Opening adequate. Approach to Bridge good—Visibility for 700', Grade 0% for 550', 3% for 150'. Approach from Bridge bad—Curve at end of Bridge—Visibility for 200', Grade θ% for 200'. Steel handrail both sides.  

(See Reverse Side for Notes)
NOTES:

1. Show kind of crossing by checking descriptive item applicable. For multiple span bridges give complete information on each span, including approach spans. If underpass or overpass, show railroad number of structure.

2. Sketch on Form HPS-6 approximate angle of structure with respect to center line of road and show direction of stream flow.

3. On arch bridges show clear span face to face abutments at spring line. On metal bridges show length of steel. Skew arch spans to be measured at right angles to face of abutments at spring line.

4. Show actual type construction under one of the following general types: Truss, Girder (Beam or Stringer), integral slab and beams, Slab, Arch, Suspension, Cantilever or Covered Bridge as shown in the Manual.

5. Give minimum lateral clearance. Where traffic lanes are separated by bridge members, show width of each lane separately.

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

7. Under remarks give notation of "Adequacy" or "Inadequacy" of bridge opening.

8. For multiple span culverts show number of units and length of each under "Spans." Show "Type and Material" under substructure and total length of bridge in place provided. For arches fill in all items applicable.
State and Federal route - Traffic heavy at all times.
### State Highway Board of Georgia

**Division of Highway Planning Survey**

In cooperation with U.S. Bureau of Public Roads

**Coordinate Sheet**

**Date:** Dec. 9, 1921

**Road No.:** Ga. 1 US 27

**County:** Polk

**Location:** South from Cedartown

**Road No.**
- Begin: 1
- End: 6

**Begin Road No.:** 1

**End Road No.:** 6

**Road No.**
- Haralson Co. Line

<table>
<thead>
<tr>
<th>(1) Odometer</th>
<th>(2) Distance</th>
<th>(3) Bearing</th>
<th>(4) Latitude</th>
<th>(5) Departure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 591.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 92.35</td>
<td>.44</td>
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<td>-44</td>
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<tr>
<td>2 92.90</td>
<td>.55</td>
<td>8-14-E</td>
<td>53</td>
<td>97</td>
</tr>
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<td>3 93.37</td>
<td>.47</td>
<td>8-03-E</td>
<td>47</td>
<td>144</td>
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<td>4 94.16</td>
<td>.79</td>
<td>8-18-W</td>
<td>75</td>
<td>219</td>
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<td>5 94.55</td>
<td>.39</td>
<td>8-04-W</td>
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<td>258</td>
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<td>6 95.06</td>
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<td>7 95.47</td>
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<td>8-45-E</td>
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<tr>
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<td>.48</td>
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<td>373</td>
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<td>8</td>
<td>381</td>
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<tr>
<td>11 96.62</td>
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<td>27</td>
<td>408</td>
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<tr>
<td>12 97.00</td>
<td>.38</td>
<td>8-13-E</td>
<td>37</td>
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</tr>
<tr>
<td>13 97.20</td>
<td>.20</td>
<td>8-00-W</td>
<td>20</td>
<td>465</td>
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<tr>
<td>14 97.70</td>
<td>.50</td>
<td>8-18-W</td>
<td>48</td>
<td>513</td>
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<tr>
<td>15 98.12</td>
<td>.42</td>
<td>8-03-E</td>
<td>42</td>
<td>555</td>
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<tr>
<td>16 98.80</td>
<td>.68</td>
<td>8-30-E</td>
<td>59</td>
<td>614</td>
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<tr>
<td>17 99.21</td>
<td>.41</td>
<td>8-08-E</td>
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<td>655</td>
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<tr>
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<td>8-05-W</td>
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<td>680</td>
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<tr>
<td>19 99.69</td>
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<td>8-15-E</td>
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<td>702</td>
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<td>.21</td>
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<td>.53</td>
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<td>47</td>
<td>-765</td>
</tr>
</tbody>
</table>

**Intersecting Road Equalities:**

<table>
<thead>
<tr>
<th>Dist. No.</th>
<th>Party No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.15 Rd.</td>
<td>10</td>
</tr>
<tr>
<td>592.13 Rd.</td>
<td>10</td>
</tr>
<tr>
<td>70.12</td>
<td>10</td>
</tr>
<tr>
<td>73.46</td>
<td>10</td>
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<td>10.74</td>
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<td>19.53</td>
<td>112</td>
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<td>93.75</td>
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<tr>
<td>74.87</td>
<td>103</td>
</tr>
<tr>
<td>48.83</td>
<td>79</td>
</tr>
<tr>
<td>75.56</td>
<td>104</td>
</tr>
</tbody>
</table>

**Triangulation Stations:**

| #19A-50 | 44° W of CL at 94.25 |
| #19A-46 | 22° W of CL at 99.42 |

**Total:** 8.52

---

**Columns 1, 2 and 3, and (+) and (—) of 4 and 5 computed by:**

H. L. Holley (Party Chief)

**Columns 4 and 5 computed by:**

W. F. Davis (Field Draftsman)

**Checked by:**

W. F. Davis (Field Draftsman)

H. R. Jacobson (Supervisor)
STATE HIGHWAY BOARD OF GEORGIA
DIVISION OF HIGHWAY PLANNING SURVEY
In Cooperation with U. S. Bureau of Public Roads

ODOMETER CORRECTION FACTOR

0. T. Ray, State Director
Highway Planning Survey
305 Bona Allen Building
Atlanta, Georgia

Attention Assistant Director in Charge of Road Inventory

This is to certify that the odometer in the Chevrolet (Kind of Car)
bearing Georgia license number 3598-C 1938 (State)
owned by H. L. Holley and operated by H. L. Holley
has been tested and in my opinion is in a satisfactory condition for field use
in connection with the Road Inventory.

ODometer Check

Description of Location of Test Run FAP #34—Haralson County, traveling East
on US #78, Ga. #8 from FAP marker in Bremen to FAP marker on the
Haralson-Carroll County Line.

<table>
<thead>
<tr>
<th>Measured Distance</th>
<th>5.648 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odometer Distance</td>
<td>5.65 Miles</td>
</tr>
<tr>
<td>Odometer Error</td>
<td>0.00 Miles</td>
</tr>
<tr>
<td>Error - percent</td>
<td>0.00 Percent</td>
</tr>
<tr>
<td>Correction Factor</td>
<td>0.00</td>
</tr>
<tr>
<td>Rear Tire Pressure</td>
<td>32 Lbs.</td>
</tr>
</tbody>
</table>

Remarks: New concrete road. Same test run made by the District Supervisor in opposite direction with the same results.

Date January 21, 1938  Supervisor Herbert R. Jacobson
District #1 - Cartersville

Original to Atlanta Office
Duplicate to District Supervisor
Triplicate to Chief of Party
INVENTORY TAG

FRONT

WARNING
PENALTY FOR
DISTURBING THIS TAG

STATE HIGHWAY BOARD OF GA.
Division Of Highway Planning
Survey in Cooperation with

U. S. BUREAU
of
PUBLIC ROADS

Road No. 10
Odometer Reading 28.15
Direction Traveling E-0-0
Zone No. 3
Party No. 1
Date 12-10-37
Time 10:05
Intersection Road No. 1-South
Odometer Reading 92.13

BACK

Begin Road No. 10
Drafting
Map Series

The data secured by road inventory parties is so complete in detail that it is possible to construct a series of maps which will give to us the first true picture of our entire transportation system throughout the nation. Analysis of this series will not only give us a basis for future highway construction, but will also provide us with the means of routing all types of traffic. The latter factor alone will be of vital importance because of the effect it will have on accident control and also because it will permit us to economize and unify our entire distribution system.

The kind of maps recommended for counties and states are as follows:

County Series:
1. Base Map
2. General Highway and Transportation Map
3. Bus and Truck Map
4. School Bus Route Map
5. Postal Route Map

State Series:
1. Base Map
2. Highway Map
3. Transportation Map

Each type of map should contain the following information:
County Series:
Base maps should show:
1. State, county and township boundaries and names
2. Congressional or U. S. survey township and section lines, where actually established by survey
3. Boundaries of all Federal, State, and local parks and reservations with name and class of each
4. Corporate limits of all cities
5. Geographic and city center of all cities and villages
6. Names of all cities and villages
7. All bays, lakes, rivers, canals and important minor drainage with names
8. All main drainage and irrigation ditches
9. All railroads and railroad stations in rural areas and within cities, with name of operating companies
10. All rural roads, plotted as open bands
11. Federal and State highways only, plotted as open bands, through incorporated cities
12. Projection of main roads beyond county lines, indicating nearest important town
13. All important highway bridges, indicating the type
14. All railroad crossings, indicating grade crossings, underpasses and overpasses
15. All cultural items inventoried in rural areas
16. The population by figures of all urban places with a population of 1000 or over
17. Names of adjoining counties and bordering states

General highway and transportation maps should show, superimposed upon the base map features, the following information:

1. Surface types, by symbol, of all roads carried on base maps
2. By symbols, navigable waters and waters actually navigated for public commercial transportation

3. All commercial and other airports by symbol and name

4. The numbers of all roads designated as U.S. highways and as State routes

5. By the letters FAS, all roads included in the approved Federal Aid Highway System

6. The slope distance in miles, and tenths of miles, between the following points:
   (a) Between the center of incorporated places and their corporate limits
   (b) Between corporate limits and the nearest significant highway intersections
   (c) Between centers of small towns and villages and the nearest significant highway intersections
   (d) Between significant highway intersections in rural territory
   (e) Between county seats and all cities and towns of 1000 population or more via the shortest and best route

Bus and truck maps should show, superimposed upon the base map features, all U.S., State, and Federal-Aid Highways; and by symbols, all roads used by:

1. Public bus lines

2. Common carrier truck lines

3. Both public bus lines and common carrier truck lines

School bus maps should show, superimposed upon base map features, all U.S., State, and Federal-Aid Highways, and by symbols, all roads used by school buses.
Postal route maps should show, superimposed upon base map features, all U.S., State, and Federal-Aid Highways, and by symbols, all roads used by:

1. Rural Free Delivery mail routes
2. Star Mail routes

State Series:

The base map should carry the following information:

1. County lines
2. Federal and State reservations
3. Cities and towns at junctions of U.S., Federal-Aid, State, and important secondary highways, county seats and other towns on routes between main road intersections
4. All principal drainage with name
5. U.S. numbered highways, Federal-Aid, and State highway systems, and all important county or local roads, by open bands, without indication of class or surface type
6. Railroads without name of operating companies
7. Each degree of latitude and longitude represented by fine lines
8. Names of adjoining states
9. Names of adjoining counties in bordering states

The highway map should show, superimposed upon the features of the base map, the following additional features:

1. The surface type of all shown roads, by symbol within road bands
2. Numbers of all roads designated as U.S. Highways
3. Numbers of all roads designated as State Routes
4. Designation of Federal-Aid highways by use of the letters FAS

5. Slope distance, to the nearest mile, between cities and villages of 1000 population or more

The transportation map should show, superimposed upon features of the base map, additional information as follows:

1. The use of roads, by symbols within the open bands, as:
   (a) Public bus routes
   (b) Common carrier truck routes
   (c) Combined public bus and common carrier truck routes

2. Names of railroad operating companies

3. Commercial air routes and public and commercial airports

4. Navigable waterways, including canals, indicating those used commercially

5. U.S., State, and Federal-Aid highways

**Drafting Procedure**

All roads shall be plotted by field draftsmen, upon completion of inventory in each county, to the scale of one or two inches to the mile, depending upon the size of the county. This plotting shall be done upon hard plates upon which have been drawn mercator grid lines and upon which have been located and numbered all triangulation stations within the county, adjacent to either primary or secondary roads. Since the road inventory party chief has a complete description of all triangulation stations within each county, he can definitely locate a station
near roads being inventoried with respect to each road. These stations can then be located upon the grid plate by the field draftsman by means of X and Y coordinates. The triangulation stations thus established shall be used as control points in plotting the entire road system of a county.

All plotting of roads shall conform to a maximum error of closure of 5%; based upon the ratio of overrun or underrun distance of closure with the tie-in point to the total road mileage. This error of closure is generally too great since an experienced and careful party chief should be able to tie in road intersections within the limits of 1% or 2% error.

The draftsman shall begin plotting in each county by selecting such roads as are tied into triangulation stations, and making adjustments between these stations in order to establish the correct location of the road situated between triangulation stations. Once these roads have been adjusted, every point on them will become a control point. When the control roads have been definitely established, the other roads shall be plotted in their true position by making the necessary adjustments with respect to the various control roads.

Plotting is done by the latitude and departure method directly from the data compiled on Form HPS-8 (see sample form). The total columns on these forms for the latitude and departure of each point shall not be filled in until the extremities of the road have been plotted to ascertain whether or not an adjustment is necessary to correct for error of closure. If the error of closure is found to be very small, the adjustment shall be made by adding or subtracting one hundreth to or from each of
the longest courses in either latitude or departure as the case may be. If the error of closure is greater, a mathematical adjustment shall be made as exemplified on the sample Form HPS-8 following this section. Data on this form indicates that the compass needle has been deflected to the north and west, probably by some local attraction, which requires that the latitudes and departures be adjusted in order that bearings may be corrected to their true position.

All roads must be so plotted that they tie in at the county line with the same road which has been inventoried in the adjoining county. The controlling factor in this case will be the scale distances of the end point on the road from the nearest mercator grid lines.

After the entire road system of a county has been plotted and checked, all road structures and cultural items on each road shall be plotted upon the grid plates from the information noted on Form HPS-6, using the designated standard symbol for each item (see standard symbol plate). After all information has been included on these grid plates, tracings shall be made for the various types of maps previously described under the county and state series. Samples of these maps are shown at the end of this section.
STATE HIGHWAY BOARD OF GEORGIA  
DIVISION OF HIGHWAY PLANNING SURVEY  
IN COOPERATION WITH U. S. BUREAU OF PUBLIC ROADS  

COORDINATE SHEET  

Date: Oct. 27, 1919  

DIST.NO. 2  
PARTY NO. 1  

Odometer Correction  
Factor: 0  

Road No.: 34  
County: Rockdale  
Location: South of Conyers  

Equities:  

<table>
<thead>
<tr>
<th>Sta.</th>
<th>Odometer</th>
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<th>Bearing</th>
<th>+</th>
<th>-</th>
<th>Total</th>
<th>Departure</th>
<th>To</th>
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Triangulation Stations:  
#B2-118 at 84.00  
#B2-116 at 88.47  

Method of Correction:  

Step 1:  
4.47 x 0.05 = 0.22  

Step 2:  
2.03 - 1.42 = 0.61  

Step 3:  
1.81 + 0.21 = 2.02  

Step 4:  
2.03 + 1.42 = 3.45  

Step 5:  
(0.61) - (-1.44) = 2.02  

Columns 1, 2 and 3, and (+) and (-) of 4 and 5 computed by:  
(Party Chief)  
Checked by:  
(Field Draftsman)  
Checked by:  
(Supervisor)
LEGEND FOR COUNTY BASE MAP SERIES

ROADS

PRIMITIVE ROAD
OTHER ROADS
ROAD SYSTEM DESIGNATION
UNITED STATES HIGHWAY
STATE HIGHWAY SYSTEM

RAILWAYS

RAILROAD ANY NUMBER
OF TRACKS USED BY
SINGLE OPERATING
COMPANY
RAILROAD (ANY NUMBER
OF TRACKS) USED BY MORE
THAN ONE OPERATING
COMPANY ON SAME OR
ADJACENT RIGHTS OF WAY
NOT TRACKAGE RIGHTS
NARROW GAGE RAILROAD
ELECTRIC INTERURBAN OR
SUBURBAN RAILROAD
RAILROAD - STANDARD GAGE
PRIVATELY OWNED
RAILROAD - NARROW GAGE
PRIVATELY OWNED
RAILROAD - SERVICE ABANDONED
TRACK RETAINED
RAILROAD ON STREETS
OR ROADS
ELECTRIC RAILROAD ON
STREETS OR ROADS
GRADE CROSSING
RAILROAD ABOVE - UNDERPASS
RAILROAD BELOW - OVERPASS
RAILROAD STATION
RAILROAD TUNNEL
RAILROAD BRIDGE

DRAINAGE
NARROW STREAM OR CREEK
WIDE STREAM OR RIVER
DRAINAGE DITCH
IRRIGATION DITCH
CANAL

BRIDGES
HIGHWAY BRIDGE
NARROW STREAM
HIGHWAY BRIDGE
WIDE STREAM
DRAWBRIDGE
SUSPENSION ARCH
TRUSS (W. WOOD
S. STEEL G. GIRDER)

STRUCTURES
DAM
DAM WITH ROAD
DAM WITH LOCK
LEVEE
LEVEE WITH ROAD
FORD

NATURAL FEATURES

PROMINENT ELEVATION
(NUMERALS INDICATE
FEET ABOVE SEA LEVEL)
PASS
SCENIC POINT
WATERFALL

WATERWAYS
OPERATED SHIP OR BARGE
LINES ON NATURAL
STREAMS
WHARF DOCK PIER OR
LANDING
NAVIGABLE STREAMS
(IN FACT)
HEAD OF NAV.
HEAD OF NAV.
HEAD OF NAV.
HEAD OF NAV.
HEAD OF NAV.
HEAD OF NAV.
HEAD OF NAV.
FERRY (T.F. TOLL FERRY
F.F. FREE FERRY)
INTERNATIONAL PORT OF
ENTRY
BUS- AND TRUCK SERIES
SERVICE ON HIGHWAYS
30*BUS AND TRUCK LINES
14*BUS LINES ONLY
01*TRUCK LINES ONLY

SCHOOL BUS ROUTE SERIES
SERVICE ON HIGHWAYS
30*SCHOOL BUS LINES

POSTAL ROUTE SERIES
SERVICE ON HIGHWAYS
30*STAR MAIL AND RURAL DELIVERY MAIL ROUTE
01*STAR MAIL ROUTE ONLY
14*RURAL DELIVERY MAIL ROUTE ONLY

GENERAL HIGHWAY AND TRANSPORTATION SERIES
ROADS
ROAD SYSTEM DESIGNATION
GRAGED AND DRAINED ROAD
FA FEDERAL AID HIGHWAY SYSTEM
SOIL SURFACED ROAD
FAS FEDERAL AID SECONDARY HIGHWAY SYSTEM
METAL SURFACED ROAD
PAVED ROAD
BITUMINOUS SURFACED ROAD
AIRWAYS

* NO. ABOVE BAND INDICATES STIPPLING TYPE TO BE APPLIED
STATE-WIDE
HIGHWAY PLANNING SURVEY
SECTIONAL MAP OF NORTH DAKOTA
ILLUSTRATING STANDARD SYMBOLS AND LETTERING
FOR USE ON
STATE HIGHWAY MAP
Scale 1" = 8 miles

(Features shown are for illustration only)
Sight Distance Survey

General
A study should be made in each state to obtain a complete record of all sight distances of one thousand feet and less. This study should embrace the location, length, and cause of all critical sight distances.

The party shall consist of four men travelling in two cars. The chief of party and the location recorder shall travel in the lead car, and the sight distance observer and his recorder shall travel in the rear car.

The equipment of the party shall consist of the following:

1. Closed automobile, equipped with specially mounted stadia rod, to be used as the lead car (see drawing)
2. Closed automobile, equipped with an overrunning clutch odometer graduated to hundreths of a mile and a specially mounted stadia interceptor, to be used as the rear car (see drawing)
3. Low-powered, short-wave radio set for inter-auto communications
4. County maps showing all road numbers
5. Inventory forms (see sample forms)
6. Stationery supplies
7. Three red flags for operating protection

Test runs over known or measured distances shall be made with both automobiles, as previously explained under Road Inventory. This must be done in order to establish and maintain a constant for each odometer.
Survey Procedure

Both cars shall assemble at the starting point and make preparations to begin the survey. The hundredths odometer shall be set at zero and the reading of the standard automobile odometer shall be recorded.

Car number one shall proceed in the direction of the survey, following the right lane of traffic. Car number two shall wait until its interceptor, using the top of car number one as zero on the stadia rod, nearly covers the stadia rod, thereby indicating an interval of about 1000 feet. Inter-auto visibility of over 1000 feet will require no record being made, but the moment this visibility is lost, sight distance measurements will be maintained by the party chief in car number one by means of the rear vision mirror. A maximum speed of 45 miles per hour may be maintained where no sight distance measurements are necessary, but 15 miles per hour shall be the maximum when it becomes necessary to measure sight distances.

Since car number one is in the lead, and can observe a curve, grade, or any other obstruction of sight distance, the operator shall slow down to 15 miles per hour, and communications by means of the short-wave radio set will determine whether forward or backward displacements of the cars are necessary to locate the point of critical sight distance. A constant stadia check by the observer in car number two will show the approximate sight distance at any point. The relation of these various checks will determine the approximate position for minimum measurements.

An odometer sight distance measurement shall then be taken
to check the stadia rod reading. Car number one shall be notified to remain stationary. The sight distance recorder shall, at the instant of inter-auto visibility, note the stadia reading and record the odometer reading to tenths, hundredths and half-hundredths. Car number two shall then proceed to car number one and upon reaching it, the recorder shall note the full odometer reading, recording this reading above the first one (see sample notes). The difference between the two odometer readings shall then be compared with the stadia reading, allowing for a permissible error of three per cent.

All normal physical road features shall be considered in the survey. Crops affecting sight distances on curves shall be located as they are encountered. Obstructions at all important road junctions which influence traffic and at railroad crossings shall be recorded in the field notes (see sample notes). The standard automobile odometer shall be read at all important road intersections, at city and county lines, as well as at the beginning and end of the route being surveyed.
CARRIAGE BOLTS - 5/8" ALUMINUM RODS THREADED AND BOLTED THROUGH POLE

ELEVATION LOOKING FROM REAR OF CAR

DETAILS OF STADIA ROD
SCALE 1" = 1'-0"

FRONT OF CAR STRIPED BLACK AND YELLOW ABOVE WINDSHIELD

REAR OF CAR STRIPED BLACK AND YELLOW ABOVE WINDOW

METHOD FOR MEASURING SIGHT DISTANCE BY AUTOMOBILE
## SAMPLE OF SIGHT DISTANCE NOTES

<table>
<thead>
<tr>
<th>Car-Party Chief</th>
<th>A.H. Stephens</th>
</tr>
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<tbody>
<tr>
<td>1 Recorder</td>
<td>G.H. Nellis</td>
</tr>
<tr>
<td>Car-Observer</td>
<td>H.L. Holley</td>
</tr>
<tr>
<td>2 Recorder</td>
<td>W.F. Davis</td>
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### 8:00 A.M.

<table>
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<tr>
<th>Distance</th>
<th>Description</th>
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<tbody>
<tr>
<td>9.05</td>
<td>Bushes &amp; Trees-Right</td>
</tr>
<tr>
<td>8.165</td>
<td>C. of Ga. R.R.</td>
</tr>
<tr>
<td>8.100</td>
<td>Vertical Curve</td>
</tr>
<tr>
<td>.065</td>
<td></td>
</tr>
<tr>
<td>7.275</td>
<td>Horizontal Curve-Right</td>
</tr>
<tr>
<td>7.200</td>
<td>Railing on Concrete</td>
</tr>
<tr>
<td>.075</td>
<td>Bridge</td>
</tr>
<tr>
<td>4.170</td>
<td>Vertical-Horizontal</td>
</tr>
<tr>
<td>4.045</td>
<td>Curve-Right</td>
</tr>
<tr>
<td>.125</td>
<td>End Trees</td>
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**Low Clear Bank**

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<tr>
<td>3.260</td>
<td>Crops-Corn</td>
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<tr>
<td>.140</td>
<td></td>
</tr>
<tr>
<td>3.195</td>
<td>Horizontal Curve-Right</td>
</tr>
<tr>
<td>3.100</td>
<td>Trees, Barn &amp; House</td>
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<tr>
<td>.095</td>
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**SR - #3**

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<tr>
<td>2.050</td>
<td>Bushes, Trees &amp; Garage</td>
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<tr>
<td>0.325</td>
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**N. Corp. Line - Calhoun**

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**Gordon County**

Begin
New Concrete Highway

Unlimited Sight Distance
Horizontal Curvature Survey

General

A record of curvature data on roads is essential to safety in view of modern speed and traffic conditions. This data should include the location, length and direction of all curves.

The curvature party shall consist of a chief of party and a recorder. The equipment for this party shall consist of the following:

1. Closed automobile equipped with an overrunning clutch odometer graduated to the hundredths of a mile
2. Curvature protractor mounted on the steering post (see drawing)
3. County maps showing all road numbers
4. Inventory forms (see sample form)
5. Stationery supplies
6. Two red flags for operating protection

Test runs over known or measured distances shall be made, as previously explained under Road Inventory, in order to establish and maintain the odometer constant.

Curvature Protractor

The protractor must be graduated to full degrees, and since each standard make of automobile has its own individual turning radius, these graduations must be determined empirically.

The automobile must be driven slowly along a known tangent which is fairly level such as a street car track and stopped carefully. A blank white cardboard, cut similar to the protractor shown in the drawing on a following page, is then placed under the steering wheel and as close to it as possible without
interfering with manipulation of the steering wheel. An arc is then described on the cardboard, along the outer rim of the wheel. A zero pencil line is then drawn at the midpoint of the cardboard paralleling the projection of the tangent line being followed. A narrow strip of adhesive tape is then placed around the wheel directly in line with the zero pencil line so that the latter can be projected and marked upon the tape. The steering wheel is then carefully turned in both directions until the lost motion has been taken up. The point of lost motion is marked upon the arc opposite the zero line on the adhesive tape on both sides of the center line. The steering wheel is then brought back to its original position and strips of adhesive tape are placed on the wheel opposite the lost motion marks and a line marked on these strips. A quarter-turn point is marked on the steering wheel in a similar manner by placing the right angle vertex of a forty-five degree triangle at the center of the wheel and one side along the line of lost motion.

The car is then driven into a fairly level area and a number of circles described by holding the quarter-turn point of the wheel on the zero line of the cardboard. This must be done in both directions since the lost motion may be greater in one direction than in the other. As each circle is completed, the diameter is measured, in order that the average diameter for the full number of circles described may be determined.

The average diameter for a quarter-turn having measured 342 feet in diameter indicates a curvature of 34 degrees for the corresponding radius of 171 feet. The value of one degree of arc would, therefore, be one thirty-fourth of one quarter of
the steering wheel circumference. Since the diameter of the steering wheel can be determined, it now becomes a simple matter of constructing the protractor using the lost motion point as the zero degree mark in each direction.

The protractor should be designed on black paper using white lines and should be glued to a piece of masonite board cut to proper shape. It is then mounted on the steering post directly under the wheel and cross braced to the under side of the instrument board. All strips of tape are removed from the wheel except the original zero line strip, which serves as an indicator for the protractor. It will be necessary to cut a hole in the protractor board, as shown on the drawing, to permit reading of the odometer.

Survey Procedure

The party shall proceed to the starting point and make the necessary preparations to begin surveying. The car shall be driven so that the left front wheel is trained in a path parallel to the center line of the road and as close to it as traffic will permit. As a curve is approached, the P.O. shall be recorded by odometer reading and the degree of curve shall be read at the degree mark shown by the indicator. The speed of the car shall be 15 miles per hour, when measuring, in order that the operator can maintain his position with respect to the center line of the road. The degree of curvature shall be checked in going around the curve and at the end of the curve the odometer reading of the P.T. shall be recorded. The direction of the curve shall also be noted. All other data such as major road intersections, railroad crossings, city and county lines, shall also be recorded as shown on the sample inventory form.
TOTAL LOST MOTION IN STEERING MECHANISM OF CAR

CURVATURE MEASURING EQUIPMENT
DETAIL OF PROTRACTOR
SCALE 1/2"=1'-0"
<table>
<thead>
<tr>
<th>Party Chief</th>
<th>Recorder</th>
<th>Time</th>
<th>Action</th>
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<tbody>
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<td>A.H. Stephens</td>
<td>G.H. Nellis</td>
<td>8:00 A.M.</td>
<td>Enter Bartow County, Leave Gordon County</td>
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<table>
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<th>Radius</th>
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<td>0.060</td>
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**S Curve**

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<td>CR-#101</td>
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<tr>
<td>6.000</td>
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**Reverse**

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**SR-#3**

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<tr>
<td>2.100</td>
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**S. Corp. Line - Calhoun**

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</tr>
<tr>
<td>1.775</td>
<td>D-8</td>
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**Gordon County**

<table>
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Begin
Bituminous Surfaced Highway

No Traffic Hazards
PART IV

TRAFFIC SURVEY
Traffic Survey

General

A traffic survey is necessary to make possible a program of improvement whose financial requirements may be estimated with reasonable accuracy; and to develop a definite schedule of improvements in order that first consideration may be given to the heaviest demands of traffic. Compilation of all this data will enable us to visualize the total flow of traffic, peak traffic, seasonal traffic, foreign traffic and commercial traffic.

It is quite impossible to make a traffic count or to secure weight movement data on every road during each hour of every day; therefore, it becomes necessary to so conduct the survey that sample counts on definite schedules will provide us with sufficient information upon which statistical computations may be based. Since a final analysis of the completed survey depends upon the accuracy of averages, it is important that the location, count, timing, regularity, uniformity, and continuity of the record be maintained.

The entire traffic survey should be scheduled to operate over a period of a full year under two main divisions; one for the purpose of securing traffic density data for all types of vehicles, and the other for securing weight data for trucks and buses. Traffic density data shall be obtained by making counts at the following:

1. Key stations to be operated on primary roads only for compiling traffic density records on main routes
2. Blanket count stations to be operated on secondary or local roads to determine their traffic utilization
3. Origin-destination studies to determine the extent of urban and rural traffic movement

4. Automatic counters to provide a continuous record of traffic flow past selected points on primary and secondary roads

**Key Stations**

Key stations shall be operated in circuits of eighteen stations, the number of circuits depending upon the importance and extent of the primary roads. Georgia has twelve such circuits, making a total of 216 key stations, and in addition to this number there are 54 loadometer stations, as explained under a separate section, which are operated as a key station in conjunction with the loadometer party, thereby making a total of 270 key stations throughout the state.

One day recorder shall be assigned to each circuit operating on alternate eight-hour shifts from 6:00 A.M. to 2:00 P.M., and from 2:00 P.M. to 10:00 P.M. Fourteen eight-hour day counts shall be made at each of the eighteen stations so scheduled that a record will be obtained twice on each day of the week at separate times during the year. One night key recorder, operating from 10:00 P.M. to 6:00 A.M., shall be assigned to cover two key circuits and one loadometer circuit in order that five eight-hour night counts may be obtained on each of the key circuits, and four eight-hour night counts may be obtained on each of the loadometer circuits.

Key stations shall be located prior to the beginning of operations and sketches prepared for the recorders (see sample sketch). Careful selection of the most important intersections
on primary roads is essential since once a station has been placed in operation, it should be operated on schedule throughout the year. Any disruption of the schedule will necessarily interfere with statistical computations.

Each recorder shall be equipped as follows:

1. Clip board (18" x 24") to hold Form HPST-15
2. Hand counters (2 or 4) depending upon the volume of traffic
3. Flashlight
4. Gasoline lantern
5. Complete set of sketches for the entire circuit (see sample sketch)
6. Master schedule of operations
7. Forms HPST-11 and HPST-15 (see sample sketches)
8. Stationery and pencils

The recorder shall travel to and from stations by automobile and shall so situate himself at a station that an unobstructed view may be had of all traffic passing through the station. The operating routine of each circuit, as determined by a pre-arranged schedule, must be adhered to. Stations shall be operated regardless of weather conditions. The recorder shall always be present at his station before the scheduled time in order that the traffic count may be started exactly on the hour and he shall remain on duty without any interruptions until the end of the eight-hour shift. Any excusable delay in reaching the post of duty, such as a flat tire, must be explained by the recorder on the back of Form HPST-15 and the actual time of beginning the traffic count must be shown. If, for example, the
shift is to begin at 6:00 A.M. and the recorder fails to reach the station on time and does not begin counting traffic until 6:20 A.M., then the first hourly count shall be shown to extend from 6:20 A.M. to 7:00 A.M. and hourly thereafter.

Form HPST-15 (see sample form) shall be used to record all information and is self-explanatory. No vehicles shall be stopped by the recorder, tabulation being made by observation alone. Every vehicle, according to its classification, shall be recorded twice; first, for the leg of the intersection on which it travels to the station, and second, for the leg on which it travels from the station. All vehicles shall be classified as local if licensed in the state under survey, regardless of how many other tags may be displayed; and all other vehicles shall be classified as foreign. Traffic count shall be recorded directly upon Form HPST-15 either by means of tally marks as each vehicle passes the station or by recording the hourly hand counter total at the end of each hour.

All descriptive information relating to each leg must conform to that shown on the station sketch (see sample sketch). Any change in weather conditions must be noted since traffic movement may be greatly affected by inclement weather. Abnormal traffic movements, created by such causes as detours, fairs or sporting events, shall be described under remarks at the bottom of the form.

Hourly totals shall be recorded at the end of each hour, if feasible, and grand totals shall be recorded at the end of the period of duty. The total of every type of vehicle coming to the station each hour should coincide with the total going from
the station for the same hour; therefore, the grand total of all vehicles for the entire eight-hour count must always be an even number.

Forms HPST-11 and HPST-15 (see sample forms) shall be mailed as soon after completion of the traffic count at each station as possible in order that checking and tabulation progress may be carried forward with the least amount of interruptions.

Computation of Twenty-four Hour Annual Average

An average twenty-four hour traffic count for the various types of vehicles is developed on an annual basis for each key station. The traffic movement on each leg of an intersection is developed separately in order that a record may be obtained for each road under investigation. In order to arrive at an annual average it becomes necessary to compute the average for each eight-hour period count on a seven-day basis and then convert these period averages into a twenty-four hour annual average.

Traffic movement on Saturdays and Sundays differs materially from that on the other five week days, so the five week day average must be combined with a Saturday average and a Sunday average, in order that a true weekly average may be computed. If, for example, a density count has been secured on four week days, one Saturday and three Sundays; the total count for the four week days shall be divided by four, then multiplied by five, the total count for the three Sundays shall be divided by three and the weekly average obtained by adding the average week day count to the Saturday count and the average Sunday count. The average computed for each of the three eight-hour periods in this manner is then added and divided by seven to obtain the
full twenty-four hour annual average.

Abnormal movements of traffic caused by unusual attractions such as fairs and sporting events, must be converted into normal movement on a yearly basis before the annual average can be computed. The following example has been assumed to clarify this conversion:

<table>
<thead>
<tr>
<th>DATE</th>
<th>DAY</th>
<th>REMARKS</th>
<th>PASSENGER CARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20-37</td>
<td>Wednesday</td>
<td>County Fair</td>
<td>1793</td>
</tr>
<tr>
<td>12-11-37</td>
<td>Saturday</td>
<td></td>
<td>616</td>
</tr>
<tr>
<td>2-1-38</td>
<td>Tuesday</td>
<td></td>
<td>513</td>
</tr>
<tr>
<td>3-25-38</td>
<td>Friday</td>
<td></td>
<td>298</td>
</tr>
<tr>
<td>5-16-38</td>
<td>Sunday</td>
<td></td>
<td>444</td>
</tr>
<tr>
<td>7-7-38</td>
<td>Thursday</td>
<td></td>
<td>367</td>
</tr>
<tr>
<td>8-29-38</td>
<td>Monday</td>
<td></td>
<td>452</td>
</tr>
</tbody>
</table>

Computed total vehicles (without correction) 4483

Computed total vehicles (corrected) 3124

Method of Correction:

Total week days (excluding 10-20-37) = 1630
Average week day (excluding 10-20-37) = 1630/4 = 407.5
Excess count of 10-20-37 over average count = 1793 - 407.5 = 1385.5
Distribution of excess over each week day of year = 1385.5/261 = 5.3
Corrected average week day count = 407.5 + 5.3 = 412.8
Computed total vehicles = 412.8 x 5 + 616 + 444
= 3124
Twenty-four hour annual averages computed in this manner for every leg of each key station, make it possible to prepare a traffic flow map for every city or town of importance, from the standpoint of traffic movement. Since counts made at key stations are tabulated as to types of vehicles, both local and foreign, a traffic flow map can readily be prepared for any specific type desired.

Cartersville, Georgia, being situated at the intersection of a number of important State and Federal routes, will serve as a good example for a traffic flow map. The computed twenty-four hour annual average for each key station affected by traffic to and from this city is tabulated on the following page. It was necessary to base the computation of this annual average on a four-month period since the traffic survey has not been completed, and records are only available for this four-month period. The traffic map which follows the tabulation sheet was prepared from this computed twenty-four hour annual average and is accurate only with respect to the period for which records were available.
## Computed Twenty-four Hour Annual Average Count for Highways Serving Cartersville, Georgia.

<table>
<thead>
<tr>
<th></th>
<th>Local</th>
<th>Foreign</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Passenger Cars</td>
<td>Trucks &amp; Busses</td>
<td>Passenger Cars</td>
</tr>
<tr>
<td><strong>Station 14</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg 1 U.S. 41; Ga. 3 - To Kennesaw</td>
<td>1528</td>
<td>485</td>
<td>866</td>
</tr>
<tr>
<td>Leg 2 U.S. 41; Ga. 3 - To Marietta</td>
<td>1520</td>
<td>481</td>
<td>723</td>
</tr>
<tr>
<td>Leg 3 County Road - To Lost Mountain</td>
<td>11</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td><strong>Station 255</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg 1 U.S. 41; Ga. 3 - To Calhoun</td>
<td>750</td>
<td>371</td>
<td>755</td>
</tr>
<tr>
<td>Leg 2 U.S. 41; Ga. 3 - To Cartersville</td>
<td>1206</td>
<td>508</td>
<td>864</td>
</tr>
<tr>
<td>Leg 3 U.S. 411; Ga. 20 - To Rome</td>
<td>595</td>
<td>180</td>
<td>129</td>
</tr>
<tr>
<td><strong>Station 256</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg 1 U.S. 411; Ga. 20 - To Canton</td>
<td>53</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>Leg 2 U.S. 411; Ga. 20 &amp; 61 - To Cartersville</td>
<td>237</td>
<td>106</td>
<td>28</td>
</tr>
<tr>
<td>Leg 3 County Road - To Adairsville</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Leg 4 Ga. 61 - To Fairmount</td>
<td>238</td>
<td>92</td>
<td>29</td>
</tr>
<tr>
<td><strong>Station 286</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg 1 Ga. 61 - To Cartersville</td>
<td>149</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>Leg 2 Ga. 61 - To Dallas</td>
<td>42</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Leg 3 Ga. 113 - To Rockmart</td>
<td>118</td>
<td>33</td>
<td>4</td>
</tr>
</tbody>
</table>
24 HOUR ANNUAL AVERAGE
TOTAL TRAFFIC MOVEMENT
CARTERSVILLE, GEORGIA
SCALE 1" = 5000 VEHICLES
Blanket Count Stations

Blanket count stations are, with a few exceptions, located primarily on local roads, generally at road intersections. These stations, located at points which reveal material changes in traffic density, will supply sufficient information to create a traffic profile in somewhat the same manner that a ground profile is created.

Somewhat the same procedure is followed in securing data at the blanket count stations as is done at the key stations. One recorder is assigned to a series of stations, but operates each station only one time from 8:00 A.M. to 4:00 P.M., with the exception of a few control stations, where repeated counts are essential as a basis for traffic movement interpolation for certain selected areas. These control stations shall be operated at four different times during the year in order to determine the effect of seasonal change upon traffic movement.

Stations located on primary roads shall be operated in exactly the same manner as key stations, classifying vehicles by observation and recording all data on Form HPST-15. At local road stations, however, all vehicles shall be stopped and the drivers questioned in order to properly record the data required on Form HPST-17 (see sample form). The manufacturer's rated capacity of all trucks shall also be ascertained, either from the caution plate or by interrogating the driver. Information shall also be secured from the truck drivers as to whether they are going to or coming from a railroad station, wharf or boat. This information shall be tallied at the bottom of Form HPST-15 in its respective space, in addition to recording each truck in the usual method.
Blanket count operations in a county cannot be inaugurated until road inventory has been completed, since it is necessary to have a map of the entire road system of a county, and the road inventory party chief's statement as to observed traffic conditions on each road. By the use of this map and traffic information, it will be possible to select points of apparent traffic density change such as road intersections, entrances to manufacturing plants, resorts or other important traffic objectives.

The number of blanket count stations for the entire state is necessarily indeterminate until road inventory has been completed; however, counts can be made in one county independently of another. Selected blanket count stations which are to be used as control points or nuclei for the establishment of all other blanket count stations should be so located as to be near, but off of main roads inasmuch as all main roads are sufficiently controlled by key stations. These control stations should be located in each distinguishable cultural area throughout the state and should be numerous enough to adequately control all other blanket count stations. Location of control stations is of tantamount importance since traffic data secured at these stations will serve as a factor of interpolation with respect to rural traffic movement on primary roads as well as on secondary roads and will provide the basis for estimating an annual twenty-four hour traffic movement on every mile of road in the entire highway system.

**Origin-Destination Study**

Knowledge of the characteristics of road use on various types
of roads is of import, as well as knowledge of the amount of traffic moving over these roads. Compilation of this data will permit us to visualize the extent of general and local usage of, and the degree of urban and rural interest in various roads and classes of roads.

Origin-destination studies can only be secured by stopping vehicles at selected points of intersection on secondary as well as primary roads. This information shall be secured on secondary roads by the blanket count station recorder, as described in the preceding section. All types of motor vehicles shall be stopped and the driver interrogated in order that the required information may be obtained to properly fill out Form HPST-17 (see sample form). Origin-destination data should be obtained on primary roads only at loadometer stations, since the party operating these stations is sufficiently staffed and equipped to stop traffic without creating a hazard. However, direct questioning of drivers will usually not be attempted on primary roads unless traffic is light; instead, each vehicle will be stopped and each driver given a franked and self-addressed questionnaire card (see Form HPST-24), which he will be requested to fill out and mail. Distribution of these cards shall be made during daylight hours only.

Special origin-destination studies should also be conducted for the purpose of determining the feasibility of constructing alternate routes between certain points, by-pass or belt-line roads around certain cities, or improving existing unimproved routes. This information can only be secured by direct questioning of the traveling public at selected stations near these
points of contemplated change. Full dependence, however, should not be placed upon the data thus secured, since every new transportation facility generates new traffic which must be estimated on the basis of probable trade growth and related factors.

**Automatic Counters**

Continuous manual counts at key, loadometer and blanket count stations are necessarily impossible because of the exorbitant cost and it therefore becomes necessary to introduce another method of traffic tabulations which will be economically practicable. Uninterrupted recording of traffic can be done only by mechanical means and for this purpose an electrically controlled automatic counter has been developed by the Bureau of Roads for use on the Highway Planning Surveys. The Bureau has estimated that thirty-three such counters can be operated for the cost of one continuous manual-count station.

Automatic counters, however, cannot give the complete information necessary to make a comprehensive study of highway utilization since they record only the number of vehicles and not the type of vehicle nor the direction of travel. It is, therefore, essential that the various kinds of stations, already explained, be operated in order that a co-ordinated traffic movement pattern may be constructed from the data recorded at each type of station. Since most of the automatic counters and all of the key stations are located on main highways, it is important that the counters be installed as close to key stations as possible so that a relationship can be established between the classified manual count and the purely numerical automatic count.
FIGURE 4 - PROPOSED LAYOUT OF AUTOMATIC TRAFFIC-COUNTER INSTALLATION
Most of the automatic counters should be installed on main highways in order that various traffic movement characteristics may be ascertained at locations near large cities; at considerable distances from these cities; on tourist routes; and on principal industrial and agricultural routes. A few secondary-primary road intersections which provide a stable secondary road traffic pattern should be selected as locations for a few automatic counters, so that hourly traffic fluctuations between primary and secondary roads may be determined.

The automatic counter is electrically controlled and consists of two units installed on opposite sides of the road. One unit, producing the light source, projects two beams of light, thirty-one inches apart, across the road at an angle of twenty-three degrees. The other unit consists of two photoelectric cells connected with the counting mechanism. The light source beams are focused upon the photo-electric cells and when both beams are interrupted simultaneously, by passing vehicles, the photo-electric relay is actuated, thereby operating the recording mechanism. (see sketch)

Since both beams must be interrupted, pedestrians cannot be recorded. The light beams are rendered practically invisible by installing infra-red filters in the light source unit thereby eliminating any hazard or annoyance to motorists.

The record is printed on standard adding machine paper registering the accumulated total each hour on the hour. The day and the hour is printed on the paper and post-meridian time is indicated by a dash under the hour figure. Minutes are not registered except when the mechanism stops recording altogether
because of power failure or other reasons, thereby providing means for estimating, by interpolation, the number of vehicles which passed the recorder during the period of interruption.

The counter shall be inspected at irregular intervals and a manual shall be made and compared with the mechanical count. The tape record shall be removed for each ten-day period and inspected for power or mechanical failures in order that the time, duration and type of failure may be investigated. This information shall be officially recorded on Form HPST-26 (see sample form).

Weight Data

Detailed information pertaining to all types of trucks and busses travelling on main roads throughout the state will be obtained at loadometer and pit-scale weight stations. The method of operation and the character of the information varies so that it becomes necessary to describe each type of station separately.

Loadometer Stations

This type of station shall be operated as a key as well as a loadometer station and the location shall be selected in the same manner as was the key station, previously explained. Each loadometer circuit shall consist of eighteen stations; the number of circuits depending upon the number and extent of main routes within a state, and the apparent movement of load-bearing vehicles travelling over these routes. Georgia has three such circuits, making a total of fifty-four loadometer stations throughout the State. Operation of the full eighteen stations constitutes a cycle and each cycle shall be scheduled so that every station will be operated fourteen times, on alternate eight-hour shifts, throughout the period of a full year. The
Once Important Farm to Market Road

Virtually Abandoned by Relocation
hours of duty shall be the same as for key station recorders.

One day loadometer party shall be assigned to each of the three circuits and one night party, operating from 10:00 P.M. to 6:00 A.M., shall be assigned to cover all three circuits. The loadometer party shall be composed of a chief of party, recorder, weighman, traffic officer and a key station recorder, and shall be equipped as follows:

1. Automobile (Station Wagon)
2. Loadometer scale (portable)
3. Wooden loadometer pits
4. Flags with standards
5. Signs with standards
6. Lanterns
7. Flambeaux
8. Flashlights
9. Level (carpenter)
10. Pick, shovel and axe
11. Clip boards (18" x 24")
12. Forms HPST-11, 18, 20, and 25 (see sample forms)
13. Complete set of station sketches (see sample sketch)
14. Master schedule of operations
15. Order of leg operation at each station
16. Stationery and pencils

The loadometer shall be tested for accuracy at frequent intervals by placing it upon an accurate pit scale and weighing a truck simultaneously with the pit scale, in order that a precise comparison may be obtained. The results of this test shall be officially recorded upon Form HPST-25 (see sample form).
A location on the leg of the intersection of the station to be operated shall be selected with regard to safety of the party personnel and the motoring public. A pit shall be dug on the shoulder of the road on each side for the wooden pit boxes to fit into. The depth shall be such that the top of the loadometer, resting in the wooden pit boxes, shall be level with the surface of the road at axle length distance from the loadometer. All protective devices shall be placed at their respective positions. The traffic officer shall stop all trucks and busses and instruct the driver to proceed slowly to the loadometer where the chief of party shall direct him further. Since the loadometer can only weigh one wheel at the time, the party chief shall direct the driver how to proceed, and the weighman shall slide the loadometer directly under the wheel as it approaches the pit. While the party chief is questioning the driver, the weighman shall secure other information directly from the vehicle itself. In case a truck or bus is weighed empty, Form HPST-20a (see sample form), shall be filled out and pasted on the windshield, so that the next time this truck is stopped, it need not be weighed again if empty, but if loaded, then the truck or bus should be weighed and recorded and this empty weight recorded along with the loaded weight in order to determine the carried load.

All information secured at loadometer stations shall be listed on Form HPST-18 (see sample form), directly as called for, or by symbols in its respective column as follows:

1. Local, or nearest foreign state, if more than one license plate is displayed
2. Obtained from license tag
3. Obtained from license tag

Indicate total number of tags displayed

4. Type of vehicle to be indicated by the following symbols:
   TK - Truck
   TR - Trailer
   TT - Tractor truck
   ST - Semitrailer
   Bus - Bus

Indicate total number of trailers

5. Type of body to be indicated by the following symbols:
   Bus - Bus
   CO - Covered, box, closed, delivery, panel, screen, van
   PL - Platform, flat bed
   ST - Stake, crate, rack
   TA - Tank
   OP - Open, dump, pick-up
   Pass- Passenger car used as bus or truck
   Ref - Refrigerator
   AC - Auto carrier
   CH - Chassis only
   BL - Not classified above

6. Operating classifications to be symbolized by:
   P - Private truck
   A - Common carrier truck engaged in intrastate or interstate commerce and operating over a fixed route
B - Common carrier truck engaged in intrastate or interstate commerce but not operating over a fixed route

E - Contract carrier truck engaged in intrastate or interstate commerce

S - School bus

A-1 - Common carrier bus engaged in intrastate or interstate commerce and operating over a fixed route

O - All others

7. Manufacturer's rated capacity to be obtained from plate, license tag, or by estimation, appending the letters P, L, and E respectively. Maximum gross load to be taken from caution plate or if vehicle carries no caution plate then record serial number

8. Respective wheel loads as indicated on loadometer scale

9. Double the sum of all wheel loads

10. Empty weight secured from empty weight sticker (see Form HPST-20a)

11. Difference between loaded weight and empty weight

12. Place where vehicle is owned or usually garaged

13. Place from where this particular trip was started

14. Final destination of trip

15. Total mileage including side trips, if any

16. Complete description of type of origin

17. Complete description of type of destination

18. Detailed description and amount of commodity carried, if truck, and number of passengers, if bus. If the vehicle is empty it should be so noted.
DE KALB COUNTY
NO. 044

Location Sketch of Loadometer Station

BARTOW COUNTY
NO. 008

Location Sketch of Key Station
Care shall be exercised in obtaining and recording all information since the data on each truck and bus is used in compiling statistics for the state as a whole. Reports shall be checked and mailed at the end of each operation so that computations may be carried forward progressively.

**Pit Scale Stations**

Pit scale stations shall be permanently located entirely off of the road near the edge of the right-of-way. The locations shall be on heavily traveled routes with a clear sight distance in both directions of one thousand feet or more. Four stations, in various sections of Georgia, shall be operated in rotation by one party in cycles of thirty days for each station. Trucks and busses travelling in one direction shall be stopped and weighed during a period of fifteen operating days and those travelling in the opposite direction shall then be stopped and weighed during the remaining fifteen days of the thirty day cycle. The hours of operation for the fifteen days shall be from 6:00 A.M. to 2:00 P.M. for five days; from 2:00 P.M. to 10:00 P.M. for five days; and from 10:00 P.M. to 6:00 A.M. for the remaining five days.

The party personnel shall consist of a chief of party, weighman, recorder, and traffic officer. The equipment shall consist of that issued to the loadometer party except that no loadometer will be used and that the following kind of forms and additional equipment will be issued.

*Forms HPST-19 and 20b (see sample forms)*

*Fifty foot metallic tape, divided into feet and tenths of a foot, for measuring the length and width of each vehicle*
and the wheel base length of each vehicle
Special level rod, divided into feet and tenths of a foot, for measuring the height of vehicles

Each truck and bus, as it is weighed, shall be measured to determine the overall length, width, and the height of the vehicle, including the load, and the length of the wheel base. The driver of each vehicle shall be questioned by the chief of party to obtain all pertinent data required to properly fill out Form HPST-19.

All information secured at pit scale stations shall be recorded on Form HPST-19 (see sample form), directly as called for, or by symbols in its respective column as follows:

1-3. Same instructions as described for columns 1-2-3 on Form HPST-18

4. Trade name of vehicle and year of manufacture

5-8. Same instructions as described for columns 4-5-7-18 on Form HPST-18

9. Tire equipment to be symbolized as follows:
   For tractor truck or full trailer:

   PP - two axle vehicle, single pneumatic tires, front and rear

   PPD - three axle vehicle, single pneumatic tires on two front axles and dual pneumatic tires on rear axle

   PPP - three axle vehicle, single pneumatic tires on all axles

   PDP - three axle vehicle, single pneumatic tires on front and rear axle, and dual pneumatic tires on second axle
PD - two axle vehicle, single pneumatic tires on front axle and dual pneumatic tires on rear axle
PDD - three axle vehicle, single pneumatic tires on front axle and dual pneumatic tires on other two axles
PS - two axle vehicle, pneumatic tires on front axle and solid tires on rear axle
PSS - three axle vehicle, pneumatic tires on front axle and solid tires on other two axles
SS - two axle vehicle, solid tires on both axles
SSS - three axle vehicle, solid tires on all axles

For semitrailer:

P - one axle semitrailer, single pneumatic tires
D - one axle semitrailer, dual pneumatic tires
S - one axle semitrailer, solid tires

PP - two axle semitrailer, single pneumatic tires on both axles
PD - two axle semitrailer, single pneumatic tires on front axle and dual pneumatic tires on rear axle
DP - two axle semitrailer, dual pneumatic tires on front axle and single pneumatic tires on rear axle
DD - two axle semitrailer, dual pneumatic tires on both axles
SS - two axle semitrailer, solid tires on both axles
10. Indicate size of tires on each axle
11. Leave blank, to be filled in from test data
12. Maximum overall width of vehicle or load
13. Maximum overall length of vehicle or load
   Overall distance from center of front axle to center of rear axle, indicate distance between dual axles, if any
14. Maximum overall height of vehicle or load
15-19. Record registered weight of each axle
20. Sum of all axle weights if truck or bus is loaded
21. Sum of all axle weights if truck or bus is empty
22. Difference between loaded weight and empty weight
23. Combined weight of tractor truck, semitrailer, and trailers
24. Enter axle number carrying maximum load
25. Leave blank, to be filled in later
26. Compute ratio of maximum loaded axle to total load

Trucks and busses weighed when empty shall have pit scale empty-weight sticker (see Form HPST-20b) affixed to their windshields, but if this same vehicle passes the station, carrying a load, it shall be weighed and recorded, and the empty weight shall be noted in column twenty-one. Empty vehicles which display a loadometer empty-weight sticker (see Form HPST-20a) shall be weighed on the pit scale and shall have the loadometer empty-weight sticker replaced with a pit scale empty-weight sticker. No vehicle shall be weighed more than once loaded and once empty during each five day period.
Loadometer Party and Key Recorder

Daily Report Card

Form HPS T-11

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<thead>
<tr>
<th>PARTY CHIEF'S OR RECORDER'S DAILY WORK REPORT</th>
</tr>
</thead>
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<tr>
<td>Dist. No.</td>
</tr>
<tr>
<td>-----------</td>
</tr>
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<thead>
<tr>
<th>Total Traffic Counted: Leg 1</th>
<th>Leg 2</th>
<th>Leg 3</th>
<th>Leg 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Vehicles Weighed</td>
<td>Period Worked: From</td>
<td>To</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. Origin-Destination Interviews</th>
<th>No. Cards Distributed</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Weather</th>
<th>Party Personnel</th>
<th>Odometer Reading beginning of day</th>
<th>Odometer Reading end of day</th>
<th>Total Mileage</th>
<th>Less Personal Mileage</th>
<th>Official Mileage</th>
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</table>

<table>
<thead>
<tr>
<th>Itinerary</th>
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<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>


Origin-Destination Questionnaire Card

Form HPS T-24

<table>
<thead>
<tr>
<th>Type Vehicle: (3) WHERE IS THIS VEHICLE GENERALLY GARAGED (Place of Ownership)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) In □ or Near □ (Check (V) one only)</td>
</tr>
<tr>
<td>AT WHAT POINT DID THIS TRIP BEGIN?</td>
</tr>
<tr>
<td>1) In □ or Near □ (Check (V) one only)</td>
</tr>
<tr>
<td>TO WHAT POINT ARE YOU TRAVELING?</td>
</tr>
<tr>
<td>1) In □ or Near □ (Check (V) one only)</td>
</tr>
</tbody>
</table>

PLEASE LIST ROUTES USED OR IMPORTANT PLACES PASSED THROUGH: (7-a)

<table>
<thead>
<tr>
<th>This Trip: (b) Miles</th>
<th>(c) Time Required</th>
<th>(d) Persons (Including Driver)</th>
<th>(e) Please Check Purpose of This Trip: Business</th>
<th>Social</th>
<th>Recreational</th>
</tr>
</thead>
</table>

REMARKS:

This card can be dropped in any U. S. Mail Box. SIGNATURE AND STAMP NOT REQUIRED.
### Daily Density Report

**State Highway Board of Georgia**

**Division of Highway Planning Survey**

**In Cooperation with United States Bureau of Public Roads**

**Daily Density Report**

**Date:** Feb. 15, 1935  **Day:** Friday

**Hour Period of Count:** From 2 PM to 10 PM  **Station No.:** 16

**DATETIME SAVING TIME:** (X) CENTRAL STANDARD TIME  ( ) EASTERN STANDARD TIME

**KEY STATION:**  **STATION NO.:** 16  **STATION NAME:** BLANKET COUNTY CONTROL STATION

**TOTAL VEHICLES RECORDED:** 1785

**District:** Light

<table>
<thead>
<tr>
<th>Route No.</th>
<th>U.S. #1 - Ga. #3</th>
<th>TO</th>
<th>Dalton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Route No.</th>
<th>Ga. #2</th>
<th>TO</th>
<th>La Fayette</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Route No.</th>
<th>U.S. #11 - Ga. #3</th>
<th>TO</th>
<th>Ringgold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

### Local Vehicles

<table>
<thead>
<tr>
<th>With Trailer</th>
<th>Without Trailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>House</td>
<td>Other</td>
</tr>
</tbody>
</table>

### Trucks

<table>
<thead>
<tr>
<th>Manufacturer's Rated Capacity in Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Direction From Station</th>
<th>East</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Foreign Vehicles

<table>
<thead>
<tr>
<th>Passenger Cars</th>
<th>Light</th>
<th>Medium</th>
<th>Heavy</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Direction From Station</th>
<th>West</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

---

**Signed:** C. O. Cox  **Checked:** Herbert H. Jacobsen

**Dated:** 2/16/35  **Checked:** 3/15

**Date of Visit:** 2/15/35

---

**Traffic Movement Abnormal:** No

**If so, State Reason on Back of Sheet**

**Number of Trains:** 0  **To or From Wharf or Boat:** 0  **Official Visitor:** E. R. Jacobsen

**Local Station Only:**
# TRIP CLASSIFICATION REPORT

**County:** Bartow  
**Station No.:** 302  
**District No.:** 1  
**Date:** Feb. 28, 1938  
**Hour Period:** 8 AM - 4 PM  
**Weather:** Clear & Cool

<table>
<thead>
<tr>
<th>Place of Ownership</th>
<th>Trip Origin</th>
<th>Trip Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylorsville</td>
<td>Bartow, GA</td>
<td>Fairmount, Gordon, GA</td>
</tr>
<tr>
<td>Euharlee</td>
<td>Bartow, GA</td>
<td>Cartersville, Bartow, GA</td>
</tr>
<tr>
<td>Cartersville</td>
<td>Bartow, GA</td>
<td>Cartersville, Bartow, GA</td>
</tr>
<tr>
<td>Ledds</td>
<td>Bartow, GA</td>
<td>Rockmart, Folk, GA</td>
</tr>
<tr>
<td>Rockmart</td>
<td>Folk, GA</td>
<td>Blue Ridge, Yannia, GA</td>
</tr>
</tbody>
</table>

---

**Interviewed by:** T. H. Smith  
**Checked by:** Herbert R. Jacobson  
**Chief of Party:**

---

**Daylight Saving Time:**  
**Central Standard Time:**  
**Eastern Standard Time:**
<table>
<thead>
<tr>
<th>No. of Axle</th>
<th>Axle Arrangement</th>
<th>WHEEL LOAD</th>
<th>TOTAL WEIGHT OF COMBINATION</th>
<th>PLACE OF OWNERSHIP</th>
<th>CITY</th>
<th>COUNTY</th>
<th>STATE</th>
<th>CITY</th>
<th>COUNTY</th>
<th>STATE</th>
<th>TRIP</th>
<th>TYPE OF ORIGIN</th>
<th>TYPE OF DESTINATION</th>
<th>MILEAGE</th>
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</tbody>
</table>
### Daily Truck and Bus Pit-Scale Report

**State Highway Board of Georgia**  
**Division of Highway Planning Survey**  
In Cooperation with United States Bureau of Public Roads

<table>
<thead>
<tr>
<th>Sheet No.</th>
<th>1 of 5</th>
<th>Sheets</th>
<th>District No.</th>
<th>1</th>
<th>County</th>
<th>Cobb</th>
<th>Route No.</th>
<th>1</th>
<th>Parity No.</th>
<th>1</th>
<th>Total Vehicles Recorded</th>
<th>63</th>
</tr>
</thead>
<tbody>
<tr>
<td>Official Visitors</td>
<td>R. B. Jacobson</td>
<td>610-7, 710</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Station No.</th>
<th>1</th>
<th>Bound Traffic</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Feb. 23</td>
<td>Daylight Saving Time</td>
<td>103 S. Day, Wednesday</td>
</tr>
<tr>
<td>Hour Period</td>
<td>From 3PM to 11PM</td>
<td>Central Standard Time</td>
<td>Signed By J. Johnson</td>
</tr>
<tr>
<td>Eastern Standard Time</td>
<td>Checked By B. D. Horby</td>
<td></td>
<td>H. B. Jacobson</td>
</tr>
</tbody>
</table>

#### Types of Vehicles

<table>
<thead>
<tr>
<th>Type of Body</th>
<th>Manufacturers</th>
<th>Rated Capacity or Seating Capacity or No. of Passengers</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Tire Carrying Capacity</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>Gross Weight Rating</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Commodity Carried</th>
<th>Tire Equipment</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tire Size in Inches</th>
<th>Overall Axle Load in Tons and Tenths</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>Overall Axle Load in Tons and Tenths</th>
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</thead>
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<table>
<thead>
<tr>
<th>Tire Carrying Capacity</th>
<th>Overall Axle Load in Tons and Tenths</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Weight Weight in Bushels</th>
<th>Loaded Weight</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Commodity Carried</th>
<th>Width</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Make and Year</th>
<th>State of Registration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Vehicle</td>
<td>Class</td>
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<table>
<thead>
<tr>
<th>Serial No.</th>
<th>License Number</th>
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<table>
<thead>
<tr>
<th>District No.</th>
<th>Route No.</th>
<th>Party No.</th>
<th>Total Vehicles Recorded</th>
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</table>

**R. F. H. 5T19**

<table>
<thead>
<tr>
<th>Commodity Carried</th>
<th>Type of Equipment</th>
<th>Gross Weight Rating</th>
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<table>
<thead>
<tr>
<th>Tire Carrying Capacity</th>
<th>Overall Axle Load in Tons and Tenths</th>
</tr>
</thead>
</table>

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<th>Tire Carrying Capacity</th>
<th>Overall Axle Load in Tons and Tenths</th>
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</table>

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<tr>
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<th>Width</th>
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</table>

<table>
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<tr>
<th>Make and Year</th>
<th>State of Registration</th>
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<tbody>
<tr>
<td>Type of Vehicle</td>
<td>Class</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>License Number</th>
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</table>

<table>
<thead>
<tr>
<th>District No.</th>
<th>Route No.</th>
<th>Party No.</th>
<th>Total Vehicles Recorded</th>
</tr>
</thead>
</table>

**J. R. Jacobson**

### Truck and Bus Data

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>License Number</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Make and Year</th>
<th>State of Registration</th>
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<tbody>
<tr>
<td>Type of Vehicle</td>
<td>Class</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>License Number</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>District No.</th>
<th>Route No.</th>
<th>Party No.</th>
<th>Total Vehicles Recorded</th>
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</thead>
</table>

---

### Detailed Data

<table>
<thead>
<tr>
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<th>License Number</th>
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</table>

<table>
<thead>
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<th>Make and Year</th>
<th>State of Registration</th>
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<td>Type of Vehicle</td>
<td>Class</td>
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<table>
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<th>License Number</th>
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<table>
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<tr>
<th>District No.</th>
<th>Route No.</th>
<th>Party No.</th>
<th>Total Vehicles Recorded</th>
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</thead>
</table>

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### Other Details

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>License Number</th>
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</table>

<table>
<thead>
<tr>
<th>Make and Year</th>
<th>State of Registration</th>
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<tbody>
<tr>
<td>Type of Vehicle</td>
<td>Class</td>
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<th>Serial No.</th>
<th>License Number</th>
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<table>
<thead>
<tr>
<th>District No.</th>
<th>Route No.</th>
<th>Party No.</th>
<th>Total Vehicles Recorded</th>
</tr>
</thead>
</table>

---

### Summary

- **Date:** Feb. 23
- **Time Period:** From 3PM to 11PM
- **Weather:** Cloudy
- **Signed By:** J. Johnson
- **Checked By:** B. D. Horby
- **H. B. Jacobson**

---

### Compliance Details

- **Compliance with Regulations:**
- **Safety Measures:**
- **Environmental Impact:**

---

### Additional Notes

- **Transportation:**
- **Economy:**
- **Sustainability:**

---

### Contact Information

- **Office Address:**
- **Phone:**
- **Website:**

---

### Legal Notice

- **Disclaimer:**
- **Copyright:**
- **Privacy Policy:**
Loadometer Station
Empty Weight Sticker
Form HPS T-20a

Form HPS-T-20a  LOADOMETER STATION No................................
STATE HIGHWAY BOARD OF GEORGIA
DIVISION OF HIGHWAY PLANNING SURVEY
In cooperation with U. S. Bureau of Public Roads
State____________________ License No.____________________
EMPTY WEIGHT____________POUNDS
Defacement or Removal of this Sticker
Will Require Reweighing of Vehicle

Pit Scale Station
Empty Weight Sticker
Form HPS T-20b

Form HPS-T-20b  PIT SCALE STATION No................................
STATE HIGHWAY BOARD OF GEORGIA
DIVISION OF HIGHWAY PLANNING SURVEY
In cooperation with U. S. Bureau of Public Roads
State____________________ License No.____________________
EMPTY WEIGHT____________POUNDS
Defacement or Removal of this Sticker
Will Require Reweighing of Vehicle
STATE HIGHWAY BOARD OF GEORGIA
DIVISION OF HIGHWAY PLANNING SURVEY
In Cooperation with U. S. Bureau of Public Roads

LOADOMETER TEST SHEET

District No. 1  Party No. DL-1  Date January 5, 1938

Location of Test (Place) Intersection of Ga. #12 & East Atlanta Road  Ga. Owner of Scales DeKalb County

1. Loadometer No. 4141

<table>
<thead>
<tr>
<th>Wheel No.</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
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Total Wheel Weight, Right: 1600  Left: 1600

Total Weight of Vehicle by Loadometer 3200
Total Weight of Vehicle by Scales(Pit) 3180
No. Pounds Loadometer Off (Show plus or minus) 20

2. Loadometer No. ____________

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<thead>
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<th>Wheel No.</th>
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<th>Left</th>
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</table>

Total Wheel Weight, Right: 1600  Left: 1600

Total Weight of Vehicle by Loadometer ____________
Total Weight of Vehicle by Scales(Pit) ____________
No. Pounds Loadometer Off (Show plus or minus) ____________

Signed by: R. L. Randolph  (Chief of Party)  Approved: Herbert R. Jacobson  (District Supervisor)
Mr. O. T. Ray, State Director
Highway Planning Survey
301-306 Bona Allen Building
Atlanta, Georgia

Re: Automatic Traffic Recorder No. 1
Located 5 Miles NW of Cartersville
(Route No. - U. S. No. 41; Georgia, 3
Adjacent Key Station No. 255)

Dear Sir:

I visited this recorder at 12:30 P.M., February 24, 1938. I am enclosing tape removed from recorder for period beginning 3:00 P.M., February 14, 1938, and ending 1:00 PM Feb. 24, 1938.

Power failures were noted and exact time and durations were determined from the records of the public utility supplying power (or other reliable source) as follows: None

Equipment failures were as follows: (Show time, duration and type failures)

None

If bulbs were changed since last report indicate: Right: No (Date)
Left: No (Date)

Remarks: Manual count made from 12:30 PM to 1:00 PM and compared with automatic count. Results checked.

Yours very truly,

Herbert R. Jacobson
District Supervisor

encl.
PART V

FINANCIAL SURVEY
Financial Survey

The financial survey embraces a detailed study and analysis of income and expenditures of all governmental units within the state; the relative use of the various types of roads; and the future allocation of public tax money for highway improvements. The entire financial study is divided into three sections as follows:

1. Fiscal Survey
2. Road Use Survey
3. Motor Vehicle Allocation Survey

Fiscal Survey

The purpose of the fiscal survey is to thoroughly study and analyze the tax structure of the entire state in order to estimate the financial resources which will be available for investment in a highway program of the future. To this end, a knowledge of all highway tax resources; Federal, State, County and Municipal, is essential. Due to the overlapping of receipts and expenditures in all units of government and the need for a comparative study of all taxes, it is impossible to segregate the study of highway tax resources without also studying the entire tax structure of the State.

The study of all tax records shall extend over the period of one calendar year, preferably the year just ended. The units of government to be studied shall be the State, the Counties, the Municipalities, and their respective Boards of Education; and any other units of government such as special highway districts, drainage districts, and independent school districts. The population figures published by the United States Bureau of Census,
shall be used as the basis for dividing all governmental units into two general classes, namely, rural areas and urban places. These two general classes shall in turn be subdivided into the following population groups:

**Unincorporated Areas**
- **Class A** - 2500 or more and population density of 1000 or more per square mile
- **Class B** - All other unincorporated areas

**Incorporated Places**
- **Class 1A** - 1000 and under
- **Class 1** - 1001 to 2500
- **Class 2** - 2501 to 5000
- **Class 3** - 5001 to 10000
- **Class 4** - 10001 to 25000
- **Class 5** - 25001 to 50000
- **Class 6** - 50001 to 100000
- **Class 7** - 100001 to 250000
- **Class 8** - 250001 to 500000
- **Class 9** - 500001 to 1000000
- **Class 10** - Over 1000000

All data shall be obtained from existing records of the year under study in each of the governmental units. The duty of collecting this data shall be performed by ten field auditors whose sole duty is to report all tax receipts and expenditures, as recorded, regardless of personal opinion as to their validity or the method of accounting. Only when all field auditing has been completed and a comparative study has been made of all units of government will it be feasible or advisable to criticize discrepancies or suggest changes in the method of accounting.
Tabulation of financial data shall be made on Form FS-1 (see sample form). This form is divided into three sections which shall be used for the following tabulation purposes:

Section 1 - Show total receipts for current and non-current, local and non-local purposes in their respective columns and according to the source of revenue.

Section 2 - List all commitments, according to the source of revenue, segregating those legally restricted to the payment of debt principal from those specifically allocated for other governmental units and not currently available for local purposes.

Section 3 - Tabulate all funds according to the source of revenue which are available for all local current and non-current purposes.

Tabulation of all financial data shall be done with respect to the various sources of revenue. These sources of revenue are listed in the column headed 'Items', and are to be determined in accordance with the following explanation:

1. Total tax levies is the summation of general property levies and special assessments.
2. The general property tax pertains to the direct tax on real and personal property located within a general tax district and imposed at a uniform rate, but should not include the tax imposed on motor vehicles.
3. Special assessments are those levies exacted to defray the cost of specific improvements and are based upon
the assumption of increased value on property affected by these improvements. A special assessment differs from a general property tax, in that the former is levied upon a specific group of properties, whereas, the latter is levied upon a general class of individual properties at a uniform rate.

4. The total property tax collections is the sum of the general tax and the special assessment collections.

5. Total general tax collections is the sum of collections received from the current and delinquent property tax.

6. The current general property tax collection is the actual receipt of taxes levied within the base year.

7. Delinquent general property tax collections are those derived from delinquencies of payment.

8. Special assessments are those total collections of this type of taxes, current and delinquent.

9. Other local revenues is the total of motor vehicle and other special imposts and all other general revenues.

10. Motor vehicle imposts are local taxes levied against ownership and operation of motor vehicles.

11. Other special imposts are those collected from special local tax levies.

12. Other general revenues include all earnings accrued from interest, fees, fines, and profits on incomes derived from any public service enterprise.

13. Total local taxes and revenues is the sum of total property tax collections and other local revenues.

14. Total state-administered revenues is the sum of the
subventions, shared taxes, state-administered local taxes and special aids.

15. Subventions are the amounts of monetary assistance rendered by another governmental unit, regularly established and governed by specific enactments.

16. Shared taxes are those collected under state authority and distributed to local divisions without losing their identity. Subventions differ from shared taxes in that they bear no direct relationship to the amounts derived from the residents of any one particular unit of government.

17. Local taxes are those belonging strictly to a local unit of government but administered by the state.

18. Special aids are grants provided infrequently, by the state, for temporary or emergency needs.

19-23. The description set forth above for the state-administered revenues applies to county-administered revenues except for the unit of government administering the revenues.

24. Federal aids include all temporary or emergency aid received direct from the Federal Government, but does not include PWA and RFC loans which are to be shown as borrowings.

25. Total non-local taxes and revenues is the sum of total state-administered revenues, total county-administered revenues, and federal aids.

26. Total borrowings is the sum of temporary loans and bonds.
27. Temporary loans include all assumed floating and unfunded obligations.

28. Bonds include all incurred forms of bonded or fixed indebtedness.

29. Total current receipts is the sum of total local taxes and revenues, total non-local taxes and revenues, and total borrowings.

30. Decrease in balances is the item derived from an analysis of balances at the beginning and end of the year in order that total non-local taxes and revenues may equal the sum of net direct expenditures, total debt retirements, aids and grants paid, and increase in balances.

31. This total is the sum of total current receipts and decrease in balances.

32. Direct expenditures, other than interest, are the total amounts expended by governmental units for current purposes including those allocated to other units of government, but excluding aids and grants.

33. Temporary loan interest paid is the interest paid on all floating and unfunded obligations.

34. Bond interest paid is the interest paid on bonded or fixed indebtedness.

35. Gross direct expenditures is the sum of the direct expenditures other than interest, temporary loan interest paid, and bond interest paid.

36. Deductions from gross expense include non-governmental deductions, which are commercial earnings accruing
from the sale of materials or services in excess of public requirements, and governmental deductions, which result from contractual agreements whereby one unit of government performs services or furnishes goods to another.

37. Net direct expenditures is the difference between gross direct expenditures and the deductions from gross expenditures.

38. Total debt retirement is the sum of temporary debt and bonded debt retirements.

39. Temporary debt retired is the amount of unfunded or floating obligations retired.

40. Bonded debt retired is the amount of bonded or fixed indebtedness retired.

41. Aids and grants paid include all financial assistance to other governmental units.

42. Total current expenditures is the sum of the net direct expenditures, total debt retirements, and aids and grants paid.

43. Increase in balances is the item used to balance Item 31 with Item 44 in order that these two items may be equal.

44. Total is the sum of total current expenditures and the increase in balances. This amount should balance with Item 31.

45. Total debt service is the sum of the interest paid on temporary loans, the interest paid on bonds, and the total debt retirements.
46. Total debt outstanding is the sum of outstanding temporary and bonded debts.
47. Temporary debt outstanding includes all outstanding unfunded or floating obligations.
48. Bonded debt includes all forms of outstanding bonded or fixed indebtedness.
49. Debt reserves include the book value of all sinking and debt retirement fund investments and the cash balance of such funds on hand.
50. Net debt is the difference between the total outstanding debt and the debt reserves.

Balances. The special schedule in the right hand corner of the form provides for a special analysis of balances to take care of various types of funds existing in any governmental unit.

All receipts shall be tabulated in their respective columns under the following main headings:

1. Highways
2. Other public functions
3. General fund
4. Grand total

Tabulation of these receipts shall indicate the amount legally allocated to each specific classification and to no other. No analysis will be attempted of receipts classified under the heading of General Fund.

Proper tabulation of receipts shall be based upon the following description of column classification:

A. Construction covers the cost of additions and better-
ments to the highway system, including right-of-way purchases.

B. Maintenance includes all expenditures necessary to preserve and keep each type of roadway structure and facility as nearly as possible in its original condition of construction, or improved to provide satisfactory service. Cost of maintenance should be separated as to maintenance of condition and maintenance of operation.

C. Other highway expenditures includes all items of overhead. Cost of highway patrol and municipal traffic police shall be recorded separately from regular municipal or state police systems, in order to obtain a true estimate of such service.

D. Total of all receipts listed under the main heading, 'Highways'.

E. Education covers the cost of all educational facilities such as schools, libraries, and museums.

F. Public welfare and services embraces all functions of general welfare such as personal and property protection, health and sanitation, conservation of natural resources, and charitable and recreational facilities.

G. General government expenses cover the cost of the legislative, executive, and judicial functions of government.

H. Total of all costs under the main heading, 'Other Public Functions'.

I. General fund includes all receipts not specifically allocated to any other classification.

J. Grand total of all expenditures listed.
Special analysis of Highway Finances:

It is necessary to give special consideration to the study of highway financial data in order to definitely determine the sources of revenue and expenditure. Sources of revenue shall be determined as coming from the following:

1. Taxes derived from motor vehicle registration fees and motor fuel taxes.
2. Property taxes, special imposts, subventions and aids, borrowings, reserves, and balances.

Expenditures shall be segregated as to primary, secondary, or tertiary systems, and shall be classified according to the following:

1. Road construction
2. Bridge construction
3. Right-of-way
4. Maintenance of condition
5. Maintenance of operation
6. Interest expense
7. Other

Road Use Survey

A road use survey provides the basis for determining the relative use of various roads and types of roads, by the residents of a state. The data compiled by this survey will be classified according to population groups and counties, showing not only the total mileage traveled on the various systems by vehicles registered in the state, but also the actual source of all traffic by these population groups and by counties. It will permit us to analyze the actual utilization by motorists of urban
Excellent Location with Respect to Alignment, Grade and Visibility

Sharp Curve with Limited Sight Distance
and rural portions of the state highways, of county roads, and of city streets.

Several important factors of highway planning can be determined from this study, namely:

1. The total amount of travel on various roads, and types of roads in a given area.
2. The amount of travel on all highway systems of a state by vehicle owners residing in each distinctive type or locality.
3. Comparison of the total traffic carried by various types of roads and city streets, and the relationship of this traffic to the several systems.
4. Relationship between the individuals producing this traffic and those providing the revenues for building and maintaining the roads.

Information is obtained by personally interviewing representative car and truck owners throughout the state as to where, how far, and for what purpose they drove their vehicles during the preceding twelve month period. This same information should be obtained from commercial vehicle owners such as bus and truck operators. Selection of representative vehicle owners should be carefully made in order that the individuals, who are to be interviewed, may represent the various population classes, both urban and rural, and the various occupational classes.

A special interview form (see sample Form RU-1) shall be used in collecting information for the road use survey. The following information shall be obtained in order to properly fill out the form:

1. Purpose of travel and route followed. The purpose of
the trip shall be classified under the various subdivisions of business and pleasure as indicated on the form.

2. The number of round trips for each type of trip and the miles per round trip.

3. Total miles traveled in the state and out of the state for each type of travel.

4. Total miles traveled on primary state highways, on secondary highways, and on local roads and streets respectively. This total shall then be separated as to the amount of mileage traveled on strictly rural sections of the primary and secondary roads and the amount of mileage traveled on strictly township sections of the local roads and streets.

5. The name, postoffice and legal address, and occupation of the person interviewed.

6. Make, model, net weight or capacity, license fee paid, average miles per gallon, gallons of gasoline consumed in the state for each individual car or truck being operated.

7. Number of counties traveled in other than that of residence, number of other states traveled in, and the miles to farthest point of destination.

8. Distance the owner lives from a primary state highway, secondary highway, and township or county road.

Motor Vehicle Allocation Survey

The purpose of motor vehicle allocation studies is to secure and analyze information relative to the distribution or location of motor vehicles and to fees and fuel taxes paid by owners of
these vehicles so as to classify this information by counties, by rural and urban areas, and by population groups for urban areas.

The data necessary for an analysis of this study is obtained from all motor vehicle owners by means of questionnaire cards, Form HPS-325 and Form HPS-326 (see sample forms). These cards shall be filled in by the owners for every motor vehicle in their possession and shall contain the following information:

1. Type of vehicle
2. Place of ownership or headquarters for vehicle by county, city, or nearest city if outside of corporate limits
3. Make and year model of vehicle
4. Whether vehicle was new at time of purchase
5. Present speedometer reading
6. Total number of miles traveled during the year under study, and the number of miles traveled within the state under study
7. Average number of miles per gallon of gasoline
8. Whether mileage and gasoline consumption was obtained by estimate or from actual records
9. If a bus or truck, the amount of maintenance tag fee paid; the factory weight and seating capacity
10. Occupation of owner
11. If the vehicle is for hire or not in case it is a truck

Additional information, obtained from the various governmental units, will be necessary in order that accurate and complete information will be available for a comprehensive compilation of all data. The information obtained as a result of this study
shall be tabulated according to population group and type of vehicle into the following classification tables for the year under study:

1. Motor vehicle registration
2. State, county, local, and total motor vehicle imposts
3. State registration fees paid by owners of various types of vehicles
4. State motor fuel taxes paid by owners of various types of vehicles
5. Average number of miles traveled and gallons of gasoline consumed in state per vehicle
6. Average total number of miles traveled and gallons of gasoline consumed irrespective of the state under study
7. Average state motor fuel taxes and registration fees paid per vehicle
8. Frequency distribution of passenger cars and trucks according to miles traveled
9. Relation of annual average mileage travel and gasoline consumption as reported by vehicle owners on basis of estimates and actual records
10. Percentage distribution of passenger cars by weight classes
11. Percentage distribution of trucks by rated capacity
12. Registered vehicles classified according to average number of miles traveled by vehicles in each year model group
13. Average miles per gallon of gasoline consumed by passenger cars in different weight classes
14. Average miles per gallon of gasoline consumed by trucks
in different capacity classes

15. Percentage distribution of passenger cars and trucks according to year models

16. Average miles per gallon of gasoline consumed by light, medium and heavy passenger cars according to miles traveled

17. Average miles per gallon of gasoline consumed by trucks of various rated capacities according to miles traveled.
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**STATE OF __________________**

**SURVEY OF HIGHWAY FINANCE AND ROAD USE IN __________**

**MILES TRAVELED BY MOTOR VEHICLE OWNERS**

**DISTRIBUTION OF TRAVEL BY HIGHWAY SYSTEMS AND CLASSES OF GOVERNMENTAL UNITS**

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<th>MILES PER ROUND TRIP</th>
<th>TOTAL MILES</th>
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<th>ON SECONDARY HIGHWAYS</th>
<th>ON LOCAL ROADS AND STREETS</th>
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<td>TOTAL MILES IN STATE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NAME _____________________________**

**P.O. ADDRESS ______________________**

**LEGAL RESIDENCE IN TOWNSHIP _______**

**IN THE COUNTY OF _______**

**OCCUPATION ________________________**

**PASSenger Car Make __________________**

**Motor Truck Make __________________**

**Net Weight _________________________**

**Capacity __________________________**

**Average Miles Per Gallon ______________**

**Gallons of Gas Consumed in State ______________**

**Does Owner Keep Records? __________________**

**VEHICLE TRAVELED IN ___________ COUNTIES OTHER THAN THAT OF RESIDENCE**

**NUMBER OF OTHER STATES TRAVELED IN ______________**

**FARthest DESTINATION WAS APPROXIMATELY ______________ MILES**

**DISTANCE Owner Lives FROM ______________ TOWNSHIP ROAD ______________**

**REMARKS ______________________________**

**INTERVIEW SECURED BY __________________ DATE ___________ CHECKED BY ___________**
### Form HPS-325

**Lotor Vehicle Allocation Survey**

**Questionnaire Card**

<table>
<thead>
<tr>
<th>Form HPS-325</th>
<th>DETACH AND MAIL</th>
<th>NO POSTAGE REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Use this card for one vehicle only)</td>
<td>(Check type of vehicle below)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PASSENGER CAR</th>
<th>HEARSE</th>
<th>TAXI-CAB</th>
<th>AMBULANCE</th>
<th>BUS</th>
</tr>
</thead>
</table>

1. **HEADQUARTERS FOR ABOVE VEHICLE** (Place where it is usually kept or garaged)
   - (a) Name of County
   - (b) If within corporate limits of a City or Town, give name
   - (c) If outside corporate limits of a City or Town, check here

2. **GIVE MAKE** AND **YEAR MODEL**

3. **DID YOU PURCHASE THIS VEHICLE NEW?**

4. **PRESENT SPEEDOMETER READING** MILES

5. **GIVE MILES ABOVE VEHICLE WAS DRIVEN DURING 1937; OR IF YOU CHANGED VEHICLES DURING 1937 GIVE COMBINED TRAVEL FOR BOTH VEHICLES:**
   - (a) Total miles traveled regardless of States
   - (b) Total miles traveled in Georgia

6. **AVERAGE NUMBER OF MILES OBTAINED PER GALLON OF GASOLINE**

7. **ARE THE ANSWERS TO QUESTIONS 5 AND 6 BASED ON:**
   - Estimates
   - or Records
   - (Check one)

8. **IF BUS, SHOW:** $ Maintenance tag fee paid Factory Weight Seating Capacity

9. **WHAT IS YOUR OCCUPATION?**

---

### Form HPS-326

<table>
<thead>
<tr>
<th>Form HPS-326</th>
<th>DETACH AND MAIL</th>
<th>NO POSTAGE REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Use this card for one vehicle only)</td>
<td>(Check type of vehicle)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRUCK</th>
<th>TRACTOR-TRUCK</th>
</tr>
</thead>
</table>

1. **HEADQUARTERS FOR ABOVE VEHICLE** (Place where it is usually kept or garaged)
   - (a) Name of County
   - (b) If within corporate limits of a City or Town, give name
   - (c) If outside corporate limits of a City or Town, check here

2. **GIVE MAKE** AND **YEAR MODEL**

3. **DID YOU PURCHASE THIS VEHICLE NEW?**

4. **PRESENT SPEEDOMETER READING** MILES

5. **GIVE MILES ABOVE VEHICLE WAS DRIVEN DURING 1937; OR IF YOU CHANGED VEHICLES DURING 1937 GIVE COMBINED TRAVEL FOR BOTH VEHICLES:**
   - (a) Total miles traveled regardless of States
   - (b) Total miles traveled in Georgia

6. **AVERAGE NUMBER OF MILES OBTAINED PER GALLON OF GASOLINE**

7. **ARE THE ANSWERS TO QUESTIONS 5 AND 6 BASED ON:**
   - Estimates
   - or Records
   - (Check one)

8. **SHOW:** $ Maintenance tag fee paid Factory Weight

9. **IS THIS VEHICLE OPERATED FOR HIRE?**

10. **WHAT IS YOUR OCCUPATION?**
PART VI

ROAD LIFE STUDY
Road Life Study

The purpose of a Road Life Study is to determine the average service life, rates of retirement, and annual roadway cost for each type of surfacing on all roads included in the State primary system. Life tables and curves, similar to birth, death, and population tables for human beings, will be developed from a year by year study of construction and retirement in order to determine the probable average service life and rates of retirement. Annual roadway cost will then be determined from a combined study of the average service life, construction and maintenance cost and probable salvage value.

Definitions:

Road surface is any roadway surface material other than natural earth.

Road surface life is the number of years that a section of surface is actually used before being abandoned or changed by reconstruction.

Road surface retirement or death is the removal from service of any section of road surface.

Road surface transfer is continuation of service as part of another road or street system.

Highway maintenance is the preservation of each type of roadway, structure, and facility as nearly as possible in its original condition of construction. General maintenance does not include reconstruction, resurfacing, widening, or any addition or betterment.

Salvage value is the percentage of original cost utilized in the reconstructed roadway.
Dual type pavement is one with a surface consisting of two or more types.

The Road Life Study may be broken down into three main divisions as follows:

1. Construction and retirement mileage by each separate construction contract
2. Cost of construction of each contract
3. Cost of maintenance and betterment by road sections

Information compiled in the first two divisions shall be tabulated on Form RL-1 (see sample form), and that in the last division on Form RL-2 (see sample form). The source of information shall be the records of the State Highway Department.

Form RL-1

Information shall be tabulated on Form RL-1 (see sample form), according to the following general descriptions:

Section 1:

Surface: Show cross sectional thickness and describe in detail the wearing course, using the same classification as listed under Road Inventory. If the surface is bituminous, the number of applications or courses shall be stated, whether a hot or cold mix was applied, and whether the method of preparation was by stationary or traveling plant or road mix.

Base and Foundation: Show cross section of base material and foundation and describe the type of each. The base shall be considered as any prepared course directly beneath the wearing surface and the foundation as the prepared course between the base and the natural earth sub-
Subgrade: Indicate the type and kind of treatment given to the subgrade.

Seal: Give description of the seal coat and indicate the amount and kind of bitumen and sand or pea stone used.

Bitumen: Give the amount and kind of oil, tar, asphalt or other bituminous material used.

Portland Cement: State whether the portland cement used was standard portland, high strength, high-early strength, or other special type, and give brands. If calcium chloride was added to the mix, this shall be noted.

Fine Aggregate: Describe the kind, source, and grading of the fine aggregate used in concrete and bituminous mixes.

Coarse Aggregate: Use same procedure as for fine aggregate.

Proportioning: State whether the method of proportioning the mix was by weight, volume, or design, and indicate what proportion was used.

Curing: Show whether curing was done by burlap, earth, ponding, calcium chloride, or other means and note length of curing time.

Strength of Concrete: Give average strength and age of concrete cylinders or beams at the time of construction and the strength of cores at a later date as determined by tests.

Pavement Steel: Describe the steel used in the pavement as to size, kind, type, and placement spacing.

Contraction and Expansion Joints: Give kind and placement spacing of expansion joints and indicate type of joint filler used whether sealing was from subgrade.
Longitudinal Center Joints: Show type, size, and spacing of steel for longitudinal center joint.

Shoulders: Note width of shoulder and the type, whether earth, gravel, or bituminous.

Right-of-Way: Give width of the right-of-way, indicating the length of various widths.

Section 2:

Bridges: All bridges, with spans of twenty feet or more in length, shall be described. Bridges constructed under separate contract shall be listed on separate sheets.

Section 3:

Construction Costs: Show total cost including contract payments, force accounts, state-furnished materials, and other. Additional items such as roadside development, traffic signs and markers, guard rails, and administration may be separated.

Section 4:

Describe the construction location by survey stations or mile post at the beginning and end of the project, also by termini, such as state and county lines, city limits, and route intersections.

Section 5:

This section is self-explanatory.

Section 6:

List each retirement resulting from each improvement, indicating the reason for and the method of retirement, and the type of replacement as follows:

Reason for Retirement:

1. Unclassified
2. Surface, base, and structural failures
3. Failure of surface
4. Failure of base
5. Failure of foundation or subgrade
6. Obsolescence
7. Relocation of curves and alignment
8. Grade reductions
9. Change to another or same type to meet traffic demands as to capacity, speed, and load
10. Combination of surface and structural failures and change to another or same type to meet traffic demands
11. Related highway improvements
12. Widening operations
13. Grade separations
14. Bridges and drainage structures
15. Intersections, cross-overs, and traffic circles
16. Public and private construction of dams, reservoirs, canals, sewers, and buildings
17. Catastrophes
18. Transfer by relocation of roads to another public authority which will continue the road in use.

Method of Retirement:
1. Torn up, no attempt at salvage
2. Used as a base for new surface
3. Used as a foundation for new pavement
4. Abandoned in place, not to be used further
5. Returned to another authority and continued as a public highway
Type of Replacement:

1. New construction
2. Resurfacing, same type
3. Resurfacing, different type
4. Replacement by new surface and new base, same or different type and same or greater width; old surface not saved
5. Change in alignment, vertical and horizontal
6. Widening, only when existing surface remains in use
7. Grade crossing
8. Bridge construction

Section 7:
Describe any unusual features under remarks.

Section 8: (Reverse side)
Separate contract costs and payments according to their specific divisions.

Section 9:
Indicate any unusual costs or payments under remarks.

Form RL-2

A separate study should be made of general maintenance cost, the cost of additions and betterments, and the cost of reconditioning. The study should cover as many years of the immediate past as there are suitable records available. The total cost of each operation shall include all direct and indirect charges, such as labor, consumable supplies, road equipment charges, direct overhead and supervision, and administrative costs. Detours shall be scheduled as a separate operation or as a temporary maintenance section.

All pertinent information shall be tabulated on Form RL-2
(see sample form), according to the following classifications:

Section 1:

Give detailed description of the maintenance section under investigation.

Section 2:

Describe each construction section embraced by the maintenance section being studied.

Section 3:

Tabulate by each year the average twenty-four hour density count for passenger cars, trucks and busses, and total traffic moving over each section.

Maintenance costs for all items numbered from 100 to 160, inclusive, shall be separated as to routine work and periodic work as follows:

Routine Work:

1. Patching holes, rough spots, ruts, blow-ups, and raveled edges; cleaning and clearing surface
2. Filling and trimming expansion joints and cracks
3. Sanding bleeding spots and spot sealing
4. Dragging, blading, reshaping, and scarifying
5. Repairing and maintaining the base, foundation and subgrade, and removing ledge rock
6. Mud jacking
7. Towing vehicles through mud holes and laying and removing temporary traffic ways

Periodic Work:

1. Applying dust palliatives
2. Replacing sand, gravel, crushed stone, chert and other loose surfaces with the same or similar
material to thickness of less than one inch

3. Reconditioning bituminous mats with the addition of little of no new oil or gravel

4. Treating bituminous surfaces, seal coating, and applying light road mixes to a thickness of three quarters of an inch or less in one operation

Shoulder and side approach costs (item 170) include:

1. Patching, dragging, blading, filling ruts and washouts

2. Replacing earth, gravel, and other shoulder materials

3. Reseeding and resodding shoulders

4. Bituminous treating without excavation

Drainage and roadside costs (items 180 and 190) embrace the following charges:

1. Repairing cuts, fills, back slopes, washouts, land slides, and bank protection

2. Cleaning and retrenching open drains, channels and ditches, and cleaning culverts

3. Removing wrecks, debris, fallen trees and advertising signs, and moving and repairing fences

4. Cutting and eradicating weeds, clearing brush, trimming trees, planting and sodding to prevent erosion

Drainage structures (item 200), with a span of less than twenty feet, shall include charges for:

1. Repairing

2. Repainting

3. Reflooring

Bridges and viaducts (item 210), with a span of over
twenty feet and under one hundred feet, shall include the
same costs as for drainage structures (item 200). Struc-
tures with a span of over one hundred feet shall be con-
sidered as a separate maintenance section.

Roadside development costs (item 220) shall include:

1. Replacing trees and shrubs
2. Trimming trees and shrubs
3. Mowing
4. Watering
5. Fertilizing
6. Lighting

Snow and ice control charges (item 230) embrace the fol-
lowing:

1. Installing snow fences
2. Removing snow fences
3. Removing snow and ice
4. Sanding icy surfaces

Traffic service costs (item 240) include:

1. Repairing and painting markers, signals, and gates
2. Painting guide lines
3. Repairing and painting guard rail
4. Lighting the highway and operating signals
5. Operating comfort stations and picnic grounds
6. Directing traffic temporarily during floods or wash-
outs and periods of congestion

Miscellaneous structure charges (item 250) include the
cost of repairing and maintaining the following structures:

1. Sidewalks
2. Dykes
3. Retaining walls
4. Rip-rap
5. Pumping stations

Extraordinary maintenance costs (item 360), incurred by floods, storms, fires, and earthquakes, include:
1. Repairing the surface
2. Repairing the shoulders
3. Repairing the roadside
4. Repairing the structures
5. Dynamiting ice to protect bridges

Non-maintenance administrative, engineering and other functional charges (item 270) cover the cost of the following:
1. Traffic counts
2. Operating pit scales
3. Crack and condition surveys
4. Logging route mileage
5. Right-of-way project and section markers

Section 4: (Reverse side)

Addition and betterment costs shall be segregated from general maintenance costs, and shall be separated as to charges incurred by the various items listed under this section.

Surface, base, foundation and subgrade costs (items 10 and 20) shall include:
1. Widening curves, surfaced width, or intersections
2. First seal coat, if added within ninety days after construction
3. Building new curb
4. Filling expansion joints left open on construction
5. Frost boil prevention work
6. Additional sub-surface drainage

Shoulder and side approach costs (item 30) embrace the following charges:

1. First graveling of earth shoulders, approaches and turnouts
2. First bituminous treatment of plain surfaced shoulders
3. First bituminous ribbons along edge of pavement when shoulders are excavated and gravel added
4. Building approaches and farm entrances
5. Widening shoulders

Drainage and roadside costs (items 40 and 50) include:

1. Purchase of additional right-of-way for curve widening
2. Erecting permanent snow fences or planting permanent snow screens
3. Building fences
4. Raising, lowering or widening grade
5. Widening cuts
6. Back sloping

Drainage structure expenditures (item 60) include:

1. Extending old culverts
2. Building new culverts
3. Building new wing walls to old or new drainage structures

Roadside development charges (item 70) cover the cost of original landscaping projects.

Traffic service costs (item 80) embrace the following
items:

1. Original installation of traffic controls, markers, and safety signs
2. Constructing traffic circles
3. Installing original or additional guard rail
4. Constructing comfort stations, picnic grounds, and roads to scenic or historical points

Miscellaneous structure costs (item 90) include:

1. Constructing new retaining walls
2. Building revetments
3. Installing rip-rap
4. Constructing channel changes

Section 5:

This section is self-explanatory.

Section 6:

The length and termini of each maintenance section and the portion upon which work was performed shall be indicated by the year.
## 1. Design and Construction Features

<table>
<thead>
<tr>
<th>Surface</th>
<th>Code</th>
<th>Item</th>
<th>Cost</th>
<th>Item</th>
<th>Name</th>
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<td>Div. and Co.</td>
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<td>Seal Coat</td>
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<tr>
<td>Portland</td>
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<tr>
<td>Fine Aggr. Source</td>
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<td>Project Class</td>
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<td>Strength Conc.</td>
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<td>Month and Year Comp.</td>
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<td>Add′l. R/W</td>
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<td>From Sta.</td>
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<td>Shoulders Width</td>
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## 2. Bridges

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<th>Type Rdwy Surface</th>
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## 4. Location

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<th>Miles Built</th>
<th>Sq Yd Built</th>
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## 5. General Description of Improvement

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<th>Item</th>
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## 6. Retirements of This Improvement

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<th>Miles</th>
<th>Sq Yd</th>
<th>Year</th>
<th>Reason</th>
<th>Method</th>
<th>REPLACEMENT CONSTRUCTION Type</th>
<th>Code</th>
<th>Cont No</th>
<th>REMAINING Miles</th>
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</table>

## 7. Remarks:

(Over)
## 8. CONTRACT COSTS AND PAYMENTS

<table>
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<tr>
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<td>Contract Price</td>
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<td>Additions</td>
<td>Fed. Government</td>
</tr>
<tr>
<td>Extras and Credits</td>
<td>State</td>
</tr>
<tr>
<td>Force Account</td>
<td>County</td>
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<tr>
<td></td>
<td>City</td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Deductions</td>
<td>R.R. Company</td>
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<td>State furnished Material</td>
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<td>Net Total Cost</td>
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</table>

### 3. REMARKS

(Over)
### 1. MAINTENANCE SECTION

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<tr>
<td>Route No.</td>
<td>Proj. Sec.</td>
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<tr>
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<tr>
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<td>Surface Type</td>
</tr>
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<td>Width</td>
<td>Width</td>
</tr>
<tr>
<td>Miles</td>
<td>Miles</td>
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**Location:**

### 3. GENERAL MAINTENANCE COSTS (NEAREST DOLLAR)

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<th>Item</th>
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<th>1930</th>
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<th>1932</th>
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<td>Av. Daily Tr. &amp; Bus</td>
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<td>100 Roadway surface</td>
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<td>120 Roadbed (subgrade)</td>
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<tr>
<td>140 Resurfacing, gravel, etc.</td>
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<td>150 Reconditioning</td>
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<td>160 Surface treating, sealing</td>
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<tr>
<td>170 Shoulders &amp; approaches</td>
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<td>180 Right-of-way</td>
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<tr>
<td>190 Fills, cuts, open drng.</td>
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<td>210 Bridges &amp; viaducts</td>
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<tr>
<td>220 Roadside development</td>
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<tr>
<td>230 Snow &amp; ice control</td>
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<tr>
<td>240 Traffic services</td>
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<tr>
<td>250 Misc. structures</td>
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<tr>
<td>260 Extraordinary repair</td>
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<tr>
<td>270 Adm. &amp; Engr. functions</td>
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</tbody>
</table>

**Note:** The cost items to the left will be the same as adopted by the State.

In the final analysis they can be regrouped if desirable. If the patrol sections chance identification each year it will be best to record only one year's maintenance to a sheet. If the surface type is changed a new sheet should be used for the following year.

The years to be studied will depend upon the records available.

**TOTALS**
### Form RL-2 (Reverse Side)

#### 4. COST OF ADDITIONS AND BETTERMENTS

<table>
<thead>
<tr>
<th>Item</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
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<tbody>
<tr>
<td>10 Surface &amp; base</td>
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<tr>
<td>20 Roadbed (subgrade)</td>
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<tr>
<td>30 Shoulders &amp; approaches</td>
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<tr>
<td>40 Right-of-way</td>
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<tr>
<td>50 Fills, cuts, open drng.</td>
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<tr>
<td>60 Drainage structures</td>
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<td>80 Traffic services</td>
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</table>

**TOTAL**

#### 5. GRAVEL RESURFACING, REOILING, RECONDITIONING & SEALING RECORD

##### 5a. Materials and Cost Record

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<td>Cu. yds. aggregate per mile</td>
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<td>Gals. oil per mile</td>
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<td>Kind &amp; size aggregate</td>
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<td>Kind of oil</td>
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<tr>
<td>Nature of work</td>
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</table>

**Total cost of work**

**Cost per mile**

##### 5b. Length & termini of Maintenance Section & Portion Worked Upon

<table>
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</table>
Railroad Grade Crossing

View Over Crossing Completely Restricted
PART VII

SUMMARY
Summary

A multitude of situations have arisen as a result of extended highway improvements. The burden of capital investment and maintenance placed upon the users as a whole through the medium of taxes and imposts bears no direct relationship between the users of roads and the type of operation as in the case of urban and rural residents and of commercial and private operations. There has been no generally scientific determination of amounts that should be charged against users of roads under each jurisdiction, nor has there been any accurate application of this principle of user payment.

The state highways, representing about 10 to 12 per cent of the rural mileage and 35 to 37 per cent of use, in recent years received 77 per cent of special taxes and fees. Other rural roads, representing 88 to 90 per cent of the total rural mileage and 16 to 17 per cent of use, received 17 per cent of special taxes and fees. City streets, representing 260,000 miles and 45 to 50 per cent of use, received 6 per cent of special taxes and fees.

The lack of sufficient and accurate information in the past has greatly impeded intelligent planning and we know that mistakes have been made in promoting or restricting improvements. Highway improvements have been made separately and independently of other forms of transportation, in some cases duplicating these other agencies. They have been made under the aegis of social and political purposes, but have been permitted to be used for commercial purposes without regulatory supervision, resulting in unfair distribution of cost to the non-commercial
users. Improvements have been made prior to the collection of funds so that the general public is ultimately mortgaged to assure payment. They have been made project by project, under different jurisdictions, but are being used generally by vehicles from many jurisdictions so that fees, taxes and imposts have been expended without due regard to individual improvement. In many instances, these improvements have never been designed, as a private undertaking must be designed, with consistent relation to the carrying facility of highways either as to alignment, grade, width, strength, or surfacing, nor as to safety of railroad crossings and the strength and width of bridges.

Application of the data compiled by the Highway Planning Survey will prove of inestimable value for future planning of highway improvements. The road inventory will provide us with definite information regarding the extent, type and condition of our entire highway system; the traffic survey will indicate the amount and nature of traffic over the various types of roads; the financial survey will permit us to analyze past and future distribution of public taxes with respect to highway expenditures; and finally the road life study will enable us to determine the life expectancy of the various types of roads and to design such roads as are best suited to their own particular purpose.

We must not lose sight of the fact, however, that improvement of our entire highway system is bound up implicitly with the technical advancement of the automotive industry and with the increase of motor vehicle transportation. Therefore, the data secured by this survey must be supplemented by additional information at specified intervals in order to keep the data currently
up to date. If we do not keep our information up to date, we will be as improvident as the man who designs and erects a beautiful and substantial structure and then permits it to deteriorate through lack of proper protection and maintenance.