ALABAMA
DEPARTMENT OF TRANSPORTATION

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To the Holders of this Manual:

This manual describes the organization, administration, and operational procedures of the Alabama Department of Transportation with respect to maintenance employees and maintenance activities. The purpose of the Manual is to provide supervisory personnel with a management tool to guide and assist them in conducting effective and efficient highway maintenance operations, with uniformity throughout the State of Alabama. The Manual does not establish legal standards for maintenance operations by the Alabama Department of Transportation.

Maintenance personnel have the primary duty of carrying out the Department's maintenance responsibility to provide adequate service levels to the motoring public. To ensure that this is accomplished in the most economical manner consistent with the desired results, a maintenance management system utilizing performance budgeting techniques has been implemented.

The Maintenance Manual does not describe procedures for every conceivable situation which might arise. Some unusual or emergency situation may occur which is total unpredictable. The intention is not to eliminate the need for individual judgment and initiative, but rather to provide supervisors with sufficient information about the Department's procedures and desires so that their training and experience may be applied to both routine and unusual problems within the framework of these procedures.

Useful information for maintenance personnel is also found in several other manuals of the Department which are available at district or division offices. No attempt has been made to include in the Maintenance Manual all of the information contained in these manuals which is pertinent to maintenance operations. However, certain frequently used information is included and, in some cases, reference is made to the appropriate sections of these manuals.

Maintenance personnel in supervisory positions should become familiar with the contents to this manual and conduct maintenance operations under their control unreasonable compliance with the procedures and guidelines contained herein.

The Manual supersedes any previous maintenance procedures issued by the Department that are contrary to those established by the issuance of this Maintenance Manual.

Jimmy Butts
Transportation Director

Mitchell Kilpatrick
Maintenance Engineer

MAINTENANCE MANUAL

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Chapter One

ALABAMA DEPARTMENT OF TRANSPORTATION ORGANIZATION

1.1. GENERAL ORGANIZATION

The Alabama Department of Transportation is responsible to the Governor and the people of Alabama. As a branch of state government, the Alabama Department of Transportation is responsible for planning, designing, constructing, and maintaining the highway facilities on the official state highway system and other designated public road and street systems.

The chief administrative officer of the Alabama Department of Transportation is the Transportation Director who is appointed by the Governor.

The responsibility for the operational functions of the Alabama Department of Transportation is assigned to bureaus at the general office in Montgomery and to nine division offices throughout the state.

1.2. MAINTENANCE BUREAU

The State Maintenance Engineer is responsible for supervising the operations of the Maintenance Bureau. The Maintenance Bureau's responsibility consists of maintaining the state highway system and other designated road systems in accordance with maintenance standards and policies established by the Department. The actual maintenance and improvement of these facilities are performed by field personnel within the nine divisions or by statewide maintenance personnel. The Maintenance Bureau is responsible for developing, directing and controlling maintenance operations and programs in ways that will provide adequate levels of maintenance on state-maintained facilities.

In addition to routine maintenance activities, the Maintenance Bureau also has the following responsibilities:

+ Maintenance Management - Operation and modification of the Maintenance Management System (MMS) and the Maintenance Training Program for the effective management of maintenance operations, including modifications to the Alabama Maintenance Manual and the Field Operations Manual.

+ Bridge Management - Operation and modification of the Alabama Bridge Information Management System (ABIMS) for the effective management of the state's bridge system.

+ Traffic Operations - Warranting, operation, placement and maintenance of traffic signals, signs, and markings in accordance with the MUTCD.

+ State Force Construction - Construction and improvement of highway facilities with field maintenance personnel.

+ Special Maintenance Projects Program - Completion of projects by contract or state forces which include maintenance resurfacing, roadway projects, bridge projects, traffic projects and special projects.

+ Utility Permits - The review and approval of permits to utility owners for the placement of utilities on state owned right-of-way which are under maintenance jurisdiction.

+ Access Permits - The review and approval of access permits, grading and landscaping permits, installation of drainage structure permits, cross-over permits, special political boundary signs and other types of permitted activities that might occur on state owned right-of-way under maintenance jurisdiction.

+ Junkyard Control - Control of location and appearance of junkyards adjacent to interstate and federal-aid primary highway facilities.

+ Outdoor Advertising Control - Regulation of billboards, signs and other advertising devices adjacent to interstate and certain specified federal-aid highway facilities.

+ Radio Communications - Operation and maintenance of radio base stations and mobile units.

+ Oversize-Overweight Vehicle Permits - Review and issuance of permits to use the state highways for movement of oversize and/or overweight vehicles or loads.

+ Truck Weighing - The maintenance of portable and weigh-in-motion truck weighing equipment and assistance in weighing operations at temporary and weigh-in-motion locations.

+ Statewide crews are used to perform bridge construction, bridge repair and rehabilitation, underwater bridge inspection, bridge load rating, installation and repair of communication equipment, and repair and installation of major traffic signs and traffic signals.

1.3. FIELD DIVISIONS AND DISTRICTS

The state is divided into nine geographic areas for administering operations of the Alabama Department of Transportation. The location of each division office is as follows:

First Division ---------- Guntersville
Second Division --------- Tuscumbia
Third Division ---------- Birmingham
Fourth Division ---------- Alexander City
Fifth Division ---------- Tuscaloosa
Sixth Division ---------- Montgomery
Seventh Division--------- Troy
Eighth Division ---------- Grove Hill
Ninth Division ---------- Mobile

A Division Engineer is in charge of each division and has the duty of supervising Department of Transportation activities within the division.

The Division Maintenance Engineer reports directly to the Division Engineer and assists in the coordination and supervision of maintenance activities within the division.

The District Engineer assigns and supervises construction and maintenance activities within a district. Usually one or more Highway Superintendents and one or more Project Engineers report directly to the District Engineer. The Highway Superintendents, in cooperation with the District Engineer, are charged with planning, scheduling, and reporting all maintenance operations.

In addition to the maintenance personnel within each district, the division also has specialized crews that work throughout the division. These crews perform specialized maintenance activities such as resurfacing, bridge inspection, bridge repairs, pavement striping and marking, and the installation and repair of traffic control devices.

1.4. MAINTENANCE POSITIONS AND RESPONSIBILITIES

Maintenance personnel have specific work responsibilities depending upon their position in the Bureau of Maintenance or field division.

Maintenance Engineer

- Responsible for supervising all work designated as the responsibility of the Bureau of Maintenance.

Assistant Maintenance Engineer for Roadways

- Responsible for supervision and coordination of activities required for all roadway maintenance operations. Includes supervision of the Roadside Vegetation Management Program relating to the spraying of herbicides, roadside mowing and landscaping of roadways and rest areas. Coordinates activities related to disaster assistance and hazardous materials with the Emergency Management Agency.

Assistant Maintenance Engineer for Bridges

- Responsible for supervision and coordination of activities required for all bridge maintenance operations, which includes general oversight of the overall Bridge Inspection program, supervision of the statewide bridge crews who perform emergency and routine bridge repairs for the nine divisions, supervision of the Bridge Rating Load Testing Team which performs theoretical ratings of bridges to determine safe load capacities and the need for posting, along with field load testing of structures to determine if the structures have load carrying capacity in excess of theoretical rating, and supervision of the Underwater Bridge Inspection Team which performs underwater bridge inspections and repairs statewide.

Assistant Maintenance Engineer for Management and Training

- Responsible for supervising all activities required for the operation and modification of the Maintenance Management System, and the Alabama Bridge Information Management System, revisions to the Maintenance Manual and Field Operations Manual, and supervision of the Maintenance Training Program, which includes the review and evaluation of reported data, development of the annual planning values, improved performance budgets and workloads. Coordinates meetings of and assists the Technical Advisory Committee in planning maintenance activities.

Assistant Maintenance Engineer for Permits and Operations

- Responsible for reviewing and approving permits involving use of ROW, including utility installations, grading and landscaping, installation of drainage structures, median crossovers, etc. Responsible for administering Alabama's Highway Beautification Act including Outdoor Advertising and Junkyard Control. Responsible for direct supervision of personnel who permit oversize and/or overweight vehicles or loads. Responsible for direct supervision and coordination of activities relating to rest areas, welcome centers, truck weighing, building construction, and building insurance. Responsible for direct supervision and coordination of installation and maintenance of Transportation Department radio communications, including equipment, permanent installations and mobile units.

Assistant Maintenance Engineer for Traffic Operations

- Responsible for the supervision of the development and administration of the maintenance program for traffic operations and traffic control devices on the state highway system; for the operations of the State Sign Shop and State Signal Shop; for performing testing and evaluation of various traffic control devices to determine suitability for use on the state highway system; for administering various statewide contracts for products including materials, signs, signals, pavement markings, and work protection equipment; for reviewing all requests for additions or modifications to the interstate guide sign system and to traffic signal control on the state highway system; for administering the Specific Motorist Service (Logo) Program; and for reviewing all proposed changes in speed zones on the state highway system.

The work in each of the nine field divisions is under the supervision of the appropriate Division Engineer and his staff. The Maintenance staff in each division may include but is not limited to the following positions: Assistant Division Engineer (Maintenance), Division Traffic Engineer, and Chief Bridge Inspector. These members of the Division Maintenance staff work with the District Engineers and the Maintenance personnel assigned to each district in order to accomplish the variety of tasks necessary to maintain the state-owned roads and other facilities located within the District and Division.

The variety of activities that are associated with maintenance operations require that a broad variety of skills be represented within the staff of the Division and District. The classification of personnel associated with the various maintenance crews will include many of these required skills.

Crew leaders for maintenance and work crews provide supervision of the overall operation, as well as assist in performing the work. The crew leader is responsible for seeing that the work is performed as assigned and that the crew day card is completed at the end of the day's work.

The organizational structure of the Alabama Department of Transportation Maintenance Bureau described within this chapter is intended as a general guide to the activities currently under Maintenance Bureau supervision. The descriptions of individual positions contained within this chapter do not define all of the duties and responsibilities currently assigned to these positions. The duties and responsibility of these assigned positions within the

Maintenance Bureau, Divisions, and Districts are subject to changes that will accommodate additional or modified activities within the Maintenance Bureau area of responsibility in the future.

Chapter Two

PERSONNEL PRACTICES

2.1. PERSONNEL RULES

Maintenance personnel are governed by the rules and regulations of the State of Alabama Personnel Department and the policies and procedures of the Alabama Department of Transportation. Areas of primary concern to maintenance personnel are contained in the following sections. The general personnel practices outlined in these sections are subject to frequent change and supervisory personnel must verify current policy and procedure prior to any personnel action.

2.2. EMPLOYEE CLASSIFICATIONS

Alabama Department of Transportation employees are classified as either Permanent, Hourly (Per Diem), or Extraordinary Appointments.

Permanent employees are salaried employees who have been appointed to any classified position and who have satisfactorily completed a probationary period of at least six months. They must have fulfilled all of the requirements specified by the State Personnel Department prior to appointment. Qualifications are based on education, experience, and test scores from examination, when applicable.

Hourly (Per Diem) employees are used in unclassified positions and do not have permanent employment status. They are used for unskilled or semi-skilled jobs which require no special qualifications for employment.

Extraordinary Appointments may be either Temporary, Emergency, Exceptional, or Provisional.

2.3. APPOINTMENTS AND TERMINATIONS

2.3.1. PERMANENT EMPLOYEES

2.3.1.1. Appointments

When a Bureau Chief, Division Engineer or other requesting authority has vacant classified positions and requests that the positions be filled, potential employees are selected from the list of certified eligibles provided by the State Personnel Board and who indicate their availability for the position subject to effective court orders, etc. Employees who have satisfactorily completed a probationary period of not less than six months are given permanent status in that classification by the State Personnel Department. Promotions to higher classified positions may be made when there is a vacancy and when an employee is in a promotable status, generally in the top ten on the list of certified eligibles.

2.3.1.2. Terminations

Permanent employees may be terminated by any of the following means and remain in good standing with the Department:

1. Resignation
   A permanent employee who resigns in good standing may request that his/her name be placed on the reemployment register for consideration of reemployment up to two years from time of resignation.

2. Retirement
   A permanent employee may retire in good standing subject to the Department's policy concerning retirement. All permanent employees may retire at age 60 with ten years of service, or at any age after 25 years of service credit.

An employee who is disabled and who has 10 or more years of service years of service may apply to the Employee's Retirement System for disability retirement.

3. Lay Off

Employees in classified positions may be laid off due to lack of funds or shortage of work. When employees are laid off those with the most seniority within a classification are laid off last.

All separations should be reported promptly on Form 11, Recommendation for Personnel Action.

2.3.1.3. Dismissals

Dismissals of permanent employees may be made for those causes listed in the Rules of the State Personnel Board, State of Alabama.

A Division Engineer or Bureau Chief having cause to dismiss a permanent employee should prepare a Recommendation for Personnel Action, Form 11, and a letter of dismissal stating the reasons for dismissal and the employee's right for appeal. The dismissal letter and Form 11 are to be submitted for the Transportation Director's signature. The approved dismissal letter must be sent to the employee on or before the effective date of dismissal. Form 11 and copies of the dismissal letter are to be sent to the Bureau Chief, Personnel Officer, and State Personnel Director.

If a dismissed employee's name is not placed on the reemployment register, the employee must be paid for accumulated annual leave up to a maximum of sixty days. The employee may appeal the case to the State Personnel Board if desired, but such appeal must be made in writing and filed with the State Personnel Director within 10 days following notice of such dismissal.

It is important to keep adequate records in all cases involving disciplinary action. Accurate and complete documentation is invaluable in the event an employee must be reprimanded or dismissed.

2.3.2. HOURLY (PER DIEM) EMPLOYEES

Hourly (Per Diem) employees may be hired, as needed, by the Bureau Chief, Division Engineer or the District Engineer when additional personnel are required for laborer type duties. Approval by the Transportation Director must be obtained prior to preparing and submitting Form 8, Notice of Appointment to Labor Position.

Hourly employees work at the will of the Department. Dismissals of hourly employees are not subject to appeal to the State Personnel Board.

2.3.3. EXTRAORDINARY APPOINTMENTS

2.3.3.1. Temporary

Temporary appointments are used to provide short term assistance in classified positions. Appointees for these positions are selected from the proper eligible register without regard to their standing on the register. These appointments must be approved by the State Personnel Director and cannot exceed 104 working days. Successive temporary appointments to the same position, or of the same person, cannot be made.

2.3.3.2. Emergency

Emergency appointments of one or more persons may be made without securing certification from the State Personnel Director of the names of eligible persons when an emergency arises that requires additional help in order to prevent loss of public property or serious inconvenience to the public. Any qualified person may be appointed by the Transportation Director, or designated representative, during the period of emergency. These appointments cannot exceed a period of 10 working days and cannot be renewed.

2.3.3.3. Exceptional

The State Personnel Board, upon the recommendation of the State Personnel Director, may suspend the examination requirements on an individual basis for classified positions that require exceptional qualifications. The individual appointed to this position must be a person possessing the necessary qualifications for this classification.

2.3.3.4. Provisional

Provisional appointments are made when there is no list of eligible persons for appointment to a vacancy. Persons designated for appointment to these positions must have the experience and training that appear to qualify them for the position. These appointments must be authorized by the State Personnel Director and cannot exceed a period of 156 working days, or

the length of time required to establish an appropriate register. Successive provisional appointments of the same person may not be made.

2.4. CHANGE OF STATUS

2.4.1. TRANSFERS

The Bureau Chief or Division Engineer may transfer a permanent employee from one position to another of the same class within his Bureau/Division. Employees may also transfer from a position in one Bureau/Division to a position in the same class in another Bureau/Division, provided the transfer is approved by both Bureau Chiefs/Division Engineers and the Personnel Director.

2.4.2. DISCIPLINE

Permanent employees can be disciplined by suspension without pay for a period not to exceed 30 days within a 12-month period and without the right to a hearing. Employees may also be disciplined through the dismissal process. Detailed procedures relative to dismissals and suspensions are available from the Department's Personnel Bureau or the State Personnel Department.

2.5. WORKING HOURS

The normal work week for maintenance employees consists of a 40-hour week of five eight-hour days from Saturday through Friday, excepting Saturday and Sunday. The daily work hours for District maintenance crews are from 7:30 a.m. to 4:30 p.m. on a year-round basis.

The working hours for Statewide and Divsionwide crews may be established by the Bureau Chief/Division Engineer on an individual project basis as required.

Overtime, in excess of 40 hours per payroll week, may be required during emergencies or at other times when authorized by the Bureau Chief/Division Engineer/District Engineer.

Non-exempt salaried employees are compensated at one and one-half times their hourly rate for all hours over 40 physically worked during the payroll week.

Hourly employees with one or more years of continuous service are paid their regular rate up to 40 hours per payroll week and paid at one and one-half times their hourly rate for all hours over 40 physically worked during the payroll week. All holidays or extra days off declared by the Governor are considered time off with pay.

Hourly employees with less than one year of service are paid their regular rate for up to 40 hours per payroll week, and paid at one and one-half times their hourly rate for all hours over 40 physically worked during the payroll week. Extra holidays or extra days off declared by the Governor are considered time off with pay. All other regular holidays are considered time off without pay.

Hours worked on eligible holidays are to be included when calculating the normally authorized 40 hours per payroll week. Note from above that these eligible holidays are different for hourly employees with one or more years of service.

Refer to Alabama Department of Transportation Standard Policy, Procedure, and Instruction Manual, Section FPPF 3.1-3.26 as it relates to this section.

2.6. HOLIDAYS AND LEAVE

2.6.1. HOLIDAYS

State holidays are based on Alabama Code, Section 1-3-8 (1994 Cum. Supp.). All salaried employees are paid for these holidays as long as they are in pay status the working day before and after the official holiday. Holidays falling on Sunday are celebrated on Monday and those falling on Saturday are celebrated on Friday. The legal holidays on which State offices may be closed are:

	New Year's Day	January 1st
	Martin Luther King Jr.'s/	
	Robert E. Lee's Birthday	3rd Monday of January
*	Mardi Gras Day	(Varies)
	George Washington's/	3rd Monday of February

Thomas Jefferson's Birthday	
Confederate Memorial Day	4th Monday of April
National Memorial Day	4th Monday of May
Jefferson Davis' Birthday	1st Monday of June
Independence Day	July 4th
Labor Day	1st Monday of September
Columbus Day	2nd Monday of October
Veteran's Day	November 11th
Thanksgiving	4th Thursday of November
Christmas Day	December 25th

*Mardi Gras is observed in Baldwin and Mobile Counties only. All other State employees are granted a personal leave day on January 1, which may be taken anytime during the year.

Hourly employees with at least one year of continuous service are paid for all above-listed holidays and any additional days granted by the Governor.

2.6.2. LEAVE

Different types of leave are earned and available for permanent employees. Hourly employees with at least one year of continuous service earn annual leave only. Temporary classified employees earn only sick leave.

Refer to Alabama Department of Transportation Policy, Procedure, and Instruction Manual, Section FPPF 3.9 as it relates to this section.

2.7. RELOCATION AND MOVES

When the Alabama Department of Transportation transfers a permanent employee to another location in the State, the cost of moving the employee's household goods by a mover is reimbursed up to a maximum allowed by Legislative Act in effect at the time of the move. An employee requesting a transfer to another part of the State has to pay relocation expenses.

2.8. TRAVEL AND EXPENSES

Employees may be granted expenses while away from their base location not to exceed the amount declared by Legislative Act and set by the Governor.

Payment for private car mileage is established by Legislative Act and set by the Governor.

Expenses allowed for out-of-state travel are the actual reasonable expenses incurred. Approval for reimbursement of out-of-state travel must have prior approval from the Governor.

Refer to Alabama Department of Transportation Policy, Procedure, and Instruction Manual, Section FPPF 1.4 as it relates to this section.

2.9. UNIFORMS

The Bureau of Maintenance requires uniforms for rest area/welcome center attendants and truck weighing operations personnel. These employees are provided the appropriate uniforms on their initial assignment to these positions and replacement uniforms as necessary. Each employee is responsible for keeping the uniforms clean, neat and in good repair. While on duty, the employee must wear the entire uniform and not combinations of the uniform and personal clothing. Uniforms should not be worn during off-duty hours, except when traveling to and from work.

2.10. ACCIDENTS AND INJURIES

All accidents involving maintenance employees or State property regardless of whether or not the Alabama Department of Transportation is at fault, must be reported to the Division or Maintenance Bureau Office and Division of Risk Management of the Finance Department.

The following are examples of types of accidents to be reported:

1. Accidents that involve injuries to employees in the line of duty.

2. Accidents that involve injuries to persons not employed by the Alabama Department of Transportation.

3. Accidents that involve damages to State equipment only; to State equipment and privately-owned automotive equipment; and to privately owned property.

In all accidents involving state equipment or state personnel, it is necessary that a statement be submitted from the proper personnel stating the facts and recommendations, as well as statements from all witnesses, with addresses and telephone numbers. An estimate of the cost of repairs to State and privately owned equipment should also be submitted.

For policy and actions required in accidents involving State equipment, see the Equipment Manual.

2.11. FIREARMS

It is the policy of the Alabama Department of Transportation that employees shall not wear sidearms while on duty and shall not bring firearms into the workplace for any reason. The Department has neither the authority nor the responsibility to deputize its employees for the purpose of enforcement or arrest. Concealed weapons are not allowed, even though the employee may have a valid pistol license.

Chapter Three

GENERAL OPERATIONS

3.1. LEGAL AUTHORITY

The legislation creating the Alabama Highway Department is codified by the Alabama Code Section 23-1-20 (1992 Repl. Vol.). Alabama Code Section 23-1-20 (1994 Cum. Supp.) codifies the name change from the Alabama Highway Department to the Alabama Department of Transportation. State law has designated many duties and responsibilities to the Department. In general, the basic duties and powers of the Department are:

1. to construct, repair and maintain all roads and bridges of the State, and other roads and bridges designated by law as the responsibility of the Department;

2. to determine suitable standards and methods for such construction, repair and maintenance; and

3. to promulgate all reasonable rules and adopt regulations that the Department deems necessary to carry out its responsibilities.

For the convenience of Department personnel, the Department has prepared a publication entitled Highway Laws of Alabama, containing all titles and sections of the Code of Alabama, with annotations, which pertain directly or indirectly to the administration and operation of the Department. Latest revisions must be ascertained from the Department's Legal Division prior to applying these Highway Laws.

3.2. ANNUAL MAINTENANCE BUDGET

3.2.1. APPROPRIATIONS

The Alabama Legislature appropriates funds for the administration and operation of the State Department of Transportation. The appropriations are made for a fiscal year period

which begins on October 1 and ends on September 30. Maintenance funds are appropriated and allotted by the categories of Routine Maintenance, Interstate Systems and State Systems, and Maintenance Projects. Routine Maintenance funds are allotted to each Division to be used in performing the various routine maintenance activities. The Department provides a further breakdown of Maintenance Projects funds into the categories of Resurfacing, Roadway, Bridge, Traffic, Special Projects, State Parks, and Miscellaneous. Resurfacing funds are allotted to each Division to be used to meet the resurfacing needs within the division. State Parks funds are used for the maintenance of roadways and bridges within the various state parks. The Department acts in conjunction with the Department of Conservation and Natural Resources when determining the specific uses of this category of funds. All other categories of Maintenance Projects funds are controlled by the Maintenance Bureau and are used as planned or needed.

Routine Maintenance funds are encumbered by the issuance of requisitions and purchase orders. These encumbered funds can be carried forward for a period of one fiscal year. After this period, the requisitions and purchase orders are canceled and the funds are released to the original budget category. All unencumbered routine maintenance funds are released to one or various special maintenance categories, usually Resurfacing, at the end of the fiscal year and carried forward as a beginning balance to be added to the next year's appropriation. Maintenance Projects funds are encumbered by obligating funds to a project. Routine Maintenance funds may also be transferred to the various Maintenance Projects categories to be used on projects. Obligation requests are made by submitting a Budget Allotment Request, Form F-7A, which requires the approval of the Transportation Director. These encumbered funds are carried forward for the life of the project. Any project balance is released to the original budget category at the end of the project life. Any project overrun is covered with funds from the original budget category at the end of each fiscal year or the end of the project life, whichever occurs first. All unencumbered Maintenance Projects funds are carried forward at the end of each fiscal year as a beginning balance for the next year's appropriation. In isolated instances, the balances in the Maintenance Projects categories may be transferred to the appropriation for Federal-Aid Construction to meet state matching funds requirements or to the appropriation for State Construction. This transfer is completed at the discretion and approval of the Transportation Director and requires the Governor's approval.

The Bureau of Maintenance also may request funds from the appropriation designated as State construction. These requests are made by submitting a Budget Allotment Request, Form F-7A, which must be approved by the Transportation Director. Approved "construction projects" may be performed either by contract or State maintenance personnel.

3.2.2. WORK PROGRAM

Budget requests to the Legislature by the Bureau of Maintenance through the Transportation Director are based on routine maintenance needs and estimates of resurfacing and other improvements to be performed by maintenance personnel. Section 5.3., Annual Maintenance Programs, describes how the total requirements of the maintenance work program are calculated. The maintenance work program is based on providing the desired level of maintenance service in a uniform and consistent manner throughout the State.

3.2.3. RESOURCE REQUIREMENTS

Requirements for labor, equipment and materials are identified from the annual maintenance work program. These requirements represent the resources that must be provided in order to perform the planned maintenance program.

Financial requirements for the maintenance program are determined by applying cost data to the total amounts of planned work. Section 5.4., Budgeting and Allocating Resources, describes in detail the processes for developing resource requirements and work performance budgets.

3.2.4. RESOURCE ALLOCATIONS

Resource allocations or allotments are made to individual Divisions in accordance with requirements identified by the maintenance work performance budget. This includes financial allotments, as well as labor, equipment and materials. Contractual services required for maintenance operations also are identified for each Division and statewide maintenance operation.

3.3. LIMITS OF JURISDICTION

3.3.1. STATE HIGHWAY SYSTEM

The Department of Transportation is responsible for maintaining all roads and bridges on the State Highway System, which includes Interstate routes; U.S. routes; State routes; roads, bridges and parking areas within State agricultural experimental stations, branches and substations. Additional responsibility may be placed on the Department with the approval of the Governor to maintain roads, bridges and parking areas located on the campus of any State

institution of higher learning, State hospitals, and Partlow State School and hospital; and the Alabama Agricultural Center in Montgomery. Also, the Department may be assigned the responsibility, with the approval of the Transportation Director, for maintaining roads and bridges within State parks and State-owned public fishing lake areas.

The Code of Alabama requires (SHALL) for maintenance on some roads while being permissive (MAY) for maintenance of other areas. In the permissive (MAY) cases, the approval of the Governor or the Transportation Director is required. The following listing categorizes these State facilities.

SHALL	Maintain all roads within the boundaries of any State Agricultural Experiment Station or of any branch or sub-station.
MAY	The following requires the Governor's approval: Maintain roads, streets, drives and parking areas located on the campus of any State institution of higher learning, the Alabama State hospitals, the Partlow State School and hospital, and the Alabama Agricultural Center in the city of Montgomery.
MAY	The following requires the Transportation Director's approval: Maintain roads and bridges within the State park system and State-owned public fishing lake areas.
MAY	The following requires agreement between Transportation Director and Commissioner of Conservation and Natural Resources: Maintain roads leading from a State highway to a State Park.

Responsibility for some State highways which pass through municipalities is presented in the following section on municipal connecting links.

For controlled access facilities under State jurisdiction, local service roads may be designated, constructed or maintained by the State if, in the opinion of the Transportation Director, such local service roads are necessary or desirable.

Recommendations for the establishment or modification of speed zones are the joint responsibility of the Department of Transportation and the Department of Public Safety and must be submitted to the Governor for approval.

When applying criteria obtained from the latest adopted edition of the AASHTO Policy on Geometric Design of Highways and Streets to existing facilities **for purposes other than design** such as determining sight distances, lane lengths and widths, etc., the posted speed should be substituted where reference is made to design speed.

3.3.2. MUNICIPAL CONNECTING LINKS

Municipal connecting link roads were designated by the Department pursuant to an act of the Alabama Legislature, codified in Article 4, Title 23 Code of Alabama (1992 Repl. Vol.). Article 4 also covers all state laws which pertain to municipal connecting link roads.

In the case of municipal connecting links, which are designated as part of the State Highway System, maintenance responsibility is divided between the State and the municipality. The Department of Transportation is responsible for the maintenance and repair of such streets, but Department responsibility does not extend beyond the back of curb if curb and gutter exist, or beyond the roadway ditch or toe of fill slope if no curb and gutter exist, except as necessary to place or maintain highway route markers and speed limit signs. Figure 3-1 illustrates these limits of maintenance responsibility. Truck routes, which are separate from officially designated highway routes in municipalities, are not maintained by the State.

The Department will perform routine maintenance of roadway drainage structures which are not a part of the municipality's storm sewer system but will assume no responsibility for a general drainage problem. If a drainage problem affects a roadway structure, the State assumes its fair share of correcting the opening in the structure. The municipality is responsible for all drainage that enters the municipality's storm sewer system.

Routine cleanup operations, including sweeping, sprinkling, litter pickup, and cleaning of gutters, drop inlets and catch basins, are the responsibility of the municipality. Also, the municipality is responsible for the trimming and maintenance of all trees and shrubbery within the right-of-way of the street, or that affects the sight distance of traffic using the street. The State is responsible for vegetation management of turf grass areas on median strips and between the edge of pavement and roadway ditch or toe of fill slope, if no curb and gutter exist. All other vegetation management is the responsibility of the municipality.

Traffic control is under the joint control of the municipality and the State. The State will furnish, erect and maintain speed zone markers after joint agreement is reached on speed limits, the extent of speed zones established and a city ordinance is passed. After the State and

the municipality agree on the need for traffic signals and the type of traffic signals needed, the municipality will furnish, erect and maintain the traffic signals in accordance with the permit and maintenance agreement. The municipality will also furnish, erect and maintain street lights. Placing and maintaining center and lane stripes and pavement markings in or adjacent to travel lanes is the responsibility of the State, but the municipality will mark parking spaces, bus stops and other authorized markings outside of the travel lanes.

Interstate and other State routes constructed with State or Federal and State funds within municipalities are maintained entirely by the Department between right-of-way limits. Traffic control devices on these routes are governed by Article 2, Title 32, Code of Alabama (1989 Repl. Vol.). The maintenance of traffic signals is established by maintenance agreements with the municipality or local government.

3.3.3. WORK LIMITS FOR STATE FORCES

Generally, the responsibility of the Department of Transportation is confined to the limits of the State right-of-way, except as indicated under municipal connecting links. Sometimes, however, it is necessary to go beyond the right-of-way limits to clean outfall ditches, install right-of-way fence or perform other maintenance activities. In such cases, the Department of Transportation should obtain written permission from the property owner before maintenance employees may enter the property. If permanent easements have been previously obtained, as a matter of courtesy, the Department should notify the property owner before entering the property.

The exceptions to this rule are that employees of the Department are authorized to enter private property for the purpose of making surveys necessary for the construction of roads and bridges and for the purpose of obtaining soil samples to determine its suitability as a source of material for construction, maintenance and improvements, provided that obtaining such samples does not interfere with any growing crops, and also, for the purpose of inventorying, inspecting, and/or removal of outdoor advertising signs. Although employees are authorized to enter private property for the purposes mentioned, they are still liable for any damages caused by these activities and every effort should be made to obtain permission from the property owner prior to entering private property.

Railroad crossing work limits are covered in Section 3.5.10.

On Interstate highways all grade separation structures are maintained by the Department, regardless of whether the highway passes over or under a railroad, or county road

or city street. However, the roadway surfaces and appurtenances attached to a structure on a county road or city street over an Interstate at grade separation are to be maintained by the county or municipality to the end of the structure.

On Interstate highway interchanges, the State will maintain all ramps, bridges, and roadways to the limits of either denied access or right-of-way acquired for construction or limits otherwise specified by agreement.

3.3.4. JURISDICTION OUTSIDE OF THE STATE RIGHT-OF-WAY

Under certain circumstances, the Department of Transportation has authority to regulate certain activities by individuals and corporations beyond the limits of the State right-of-way. Under the highway beautification laws in Alabama, the Department has the authority to regulate junkyards and outdoor advertising. This authority is discussed in Chapter Four, PERMITS.

According to the highway laws, the Department may provide financial aid to other State agencies, cities and counties for the maintenance of any public road or street in the State if, in the opinion of the Transportation Director, it is in the best interest of the State to do so. However, the State is not required to provide such aid. Also, the Department may actually perform maintenance work with State forces for other state agencies, cities, counties and others on a reimbursable basis, under special work authorizations approved by the Transportation Director. This is discussed in Section 3.5., Relationships with other Agencies, and Section 3.6, Special Work Authorization.

3.3.5. ENCROACHMENTS WITHIN STATE RIGHT-OF-WAY

Alabama law and Department of Transportation regulations prohibit any individuals, companies or concerns from using the State right-of-way, without written permission for any unofficial purpose other than normal access to and from the State Highway System. The Department of Transportation has the right to remove any unauthorized signs, physical obstacles, roadside stands, paved parking areas or any other unauthorized encroachment. If the encroachment is deemed a safety hazard by Department personnel, especially by notification from law enforcement officials, the Department can remove the encroachment without prior notification to the property owner. If it is not a safety hazard, the District Engineer should send an Encroachment Notice, Form BM-5, to the property owner requesting the removal of the encroachment. If after the specified time no action has been taken by the property owner, the

District Engineer may use State personnel to remove the encroachment. Signs, advertisements or property will be stored at the local District Engineer's office for up to sixty (60) days and can be claimed by the property owner who may be required to pay for the cost of removal. Unclaimed property shall be disposed of after sixty (60) days.

Chapter 4, PERMITS, outlines the procedures, rules and regulations pertaining to the authorized use of State right-of-way.

3.4. CONTACTS WITH THE PUBLIC

3.4.1. PUBLIC APPEARANCES

Maintenance employees represent the Department of Transportation while they are performing their work. Therefore, they should be as neat and clean in appearance as the job will permit. However, if the nature of the job is such that a neat, clean appearance cannot be maintained during the day, employees need not be embarrassed or self-conscious. Badly torn and ragged clothing should be avoided, not just because of appearance but because it is unsafe when working around mechanical equipment.

When the job requires a uniform, the entire uniform must be worn and not combinations of the official uniform and personal clothing. Uniforms are to be clean and neat in appearance.

3.4.2. COMMUNICATIONS WITH THE PUBLIC

All contacts with the public, whether in person, on the telephone or in correspondence, should be honest, friendly and courteous. Exercising good judgment and expressing a sincere desire to be of service can sometimes change an unpleasant encounter into one of reason and respect.

When scheduled maintenance activities will cause delays or other inconveniences for motorists or residents, the public should be informed as early as possible of the type of activity and the approximate starting date and duration. Press releases and radio bulletins are usually sufficient for this purpose. Such releases are to be cleared through the Division Engineer, then forwarded to the Office of Public Affairs for further action.

3.4.3. COMPLAINTS

The Department of Transportation is a public service organization and should be responsive to the public. Therefore, all complaints should be acknowledged. In some cases, the complaint will require a field investigation to determine how severe and urgent the problem is. Face-to-face contact with the complainant may be necessary to clarify the problem. No corrective action should be promised until the investigation has been made to determine the proper course of action. Only the supervisor who authorizes the type of activity required can say what will be done and when it will be done. If no action is to be taken, the complainant should not be led to believe that something will be done. Simply explain why no action is required.

Complaints from the public about road conditions, Department policy or Department personnel should be handled at the District level by the District Engineer unless higher authority is needed. If the complaint comes to the District Engineer through the Division or Montgomery office, a report of the problem and the action taken should be returned to the same offices. The same is true of other agencies. For example, if a complaint is received through the State Troopers, a report should be sent to them.

3.4.3.1 Maintenance Needed and Condition Reporting

Maintenance personnel, particularly field supervisors, should constantly be aware of the condition of the highways that they are responsible for maintaining, and also be able to readily identify specific roadway sections and roadway features that require maintenance attention. Some of the conditions and maintenance needs can be scheduled for repair and correction at a later period, while others require early attention.

On a frequent basis, the District Engineer and Highway Superintendent, should discuss maintenance needs observed and review reported conditions. This will allow them to set priorities on the maintenance needs within the District.

3.4.3.2 Reported Condition

Observed or reported conditions normally consist of two separate categories.

1. Conditions that can be corrected by regularly scheduled routine maintenance work.

2. Indications of conditions that require early attention.

3.4.3.3 Recording

Each employee should report to the District Engineer or Highway Maintenance Superintendent any substandard condition observed during the course of the day. In the case of a telephone complaint to the district office, whoever takes the message may fill out an Alabama Department of Transportation Incident Report/Response Record or other appropriate documentation about significant complaints based on the telephone conversation and notify the District Engineer or Highway Maintenance Superintendent on conditions that require immediate attention.

The location portions of the documentation should be complete and thorough.

Recording the accurate location for maintenance needed work or substandard conditions allows the Highway Maintenance Superintendent to give specific instructions on where to perform the work.

3.4.3.4 Corrective Action

Conditions reported on the Alabama Department of Transportation Incident Reporting/Response Record or other appropriate documentation should be reviewed by the District Engineer and/or Highway Maintenance Superintendent to determine the type corrective action required, if any. The following identify the types of required actions:

1. Correct As Soon As Possible - Conditions which in the opinion of the District Engineer require attention as soon as can be scheduled.
2. Schedule Repairs Later - These repairs can be deferred until manpower and other resources are available.
3. Refer to Division Maintenance Engineer - Major repairs that require an improvement to existing facilities should be reviewed and scheduled with the Division Maintenance Engineer. Some reported conditions that require improvements to existing facilities will be beyond the scope of maintenance funding or capability, and are usually addressed by other Department programs as funding is available.

4. No Action Required - Conditions normally will not require any corrective action.

3.4.3.5 Correction By Maintenance Activities

The majority of all reported or observed maintenance needed work can be corrected by scheduling routine maintenance activities. The Field Operations Manual lists the major routine maintenance work activities for the Department.

3.4.3.6 Correction By Improvements and Betterments

Work performed by Maintenance personnel that results in the upgrading of an existing facility with routine maintenance funds should be approved and scheduled by the Division Maintenance Engineer. This type of work as well as other improvements and betterment projects funded with special maintenance funds should be coordinated with the total highway improvement program. Work activities for these type projects can be found in the Field Operations Manual, also.

3.5. RELATIONSHIPS WITH OTHER AGENCIES

3.5.1. LOCAL GOVERNMENTS

The Department of Transportation should cooperate with city and county officials by providing information about planned maintenance activities which may restrict traffic movements in their respective areas. It is desirable, whenever possible, to contact local officials before scheduling such work to avoid interference with community events or conflict with local regulations.

When advice and aid are provided, or maintenance work is performed, for counties and cities under Special Work Authorizations (discussed in Section 3.6.), such work should be planned jointly by local officials and the Department. The local officials should identify the desired maintenance or improvements for the roads under their jurisdiction. Technical assistance, such as cost estimates, time schedules and material specifications, may be provided by the Department.

3.5.2. STATE INSTITUTIONS

The Department of Transportation is responsible for maintaining all roads within the boundaries of any State Agricultural Experiment Station or of any branch or sub-station. Periodic reviews of these facilities should be made. This will permit early identification of maintenance work needed and allow for scheduling of such work within a reasonable period of time. Also, the Department of Transportation may be responsible for maintaining roads, bridges, and parking areas on the campus of any state institution of higher learning, the Alabama State Hospitals, the Partlow State School and Hospital, and the Alabama Agricultural Center in the city of Montgomery, as well as roads and bridges within the state park system and state-owned fishing lake areas and roads leading from a state highway to a state park. Any maintenance work needed should be performed only after approval from the appropriate authority level has been received. Normally, these agencies will contact the Department when maintenance work is needed.

3.5.3. DEPARTMENT OF PUBLIC SAFETY AND LAW ENFORCEMENT AGENCIES

The Department of Transportation should cooperate fully with the Department of Public Safety in providing safe and efficient highway facilities for the public. Areas where cooperation is important include establishment of speed zones and other traffic control zones, truck weighing, hazardous debris control and enforcement of highway laws.

When maintenance personnel are involved in a traffic accident, witness a traffic accident, or need police assistance for traffic control, the person in charge should contact the District Office by radio or telephone and request assistance from the appropriate law enforcement agency. In cities and towns with police departments, the local police department should be contacted. The State Troopers, throughout the State, and local police departments, within their police jurisdictions, are responsible for enforcement of laws dealing with public roads and motor vehicles, including traffic regulations, littering and encroachments. State Troopers are also responsible for disposing of abandoned vehicles within the right-of-way and for removing animals which are running free or are tethered within the right-of-way.

The Department of Transportation may move abandoned vehicles from the traffic lanes of the roadway to the side of the road only when they present a traffic hazard. When law enforcement agencies request assistance from the Department of Transportation for debris removal, accident site control or emergency maintenance, maintenance personnel should cooperate as fully as possible.

3.5.4. DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

The Department should cooperate with the appropriate or applicable government agencies in protecting and preserving the natural environment along the right-of-way. Maintenance operations should be reviewed and as appropriate, guidance should be sought from various agencies to ensure that detrimental effects on the natural environment are avoided or minimized.

Occasionally, the Department of Conservation and Natural Resources may change the alignment of small streams within a water shed district. Such changes may affect highway drainage structures. It is desirable to maintain liaison with this agency in order to recognize potential drainage problems before they develop.

3.5.5. OTHER STATES

Formal or informal agreements may exist with neighboring states for the maintenance of roads and bridges on the State boundaries. These agreements should be honored by maintenance personnel. If any problems arise because of these agreements, or the absence of any agreements, the Division Engineer should be contacted.

3.5.6. EMERGENCY MANAGEMENT

In case of a national emergency, Emergency Management officials have the right to control and plan the usage of public roads, especially Interstate Highways. If such a situation should arise, Emergency Management officials will notify the Department of Transportation and the general public of their actions.

3.5.7. AMBULANCE SERVICES

If a member of a maintenance crew is injured, or if a maintenance crew encounters someone in need of medical assistance, the person in charge should contact the District Office by radio or telephone and briefly describe the problem and the location. The District Office will call the nearest ambulance or rescue unit or give instructions on where to carry an injured Department employee for treatment.

3.5.8. FIRE DEPARTMENTS

Maintenance personnel who encounter any situation which requires fire department assistance should call the District Office by radio or telephone and briefly give details and location. The District Office will call the nearest fire department. If a fire department requests assistance, reasonable cooperation should be given. The District Office should notify the affected city and/or fire department when a road is closed.

3.5.9. COAST GUARD

The U.S. Coast Guard and the Department of Transportation both have interest in State Highway bridges over navigable waterways. The Department of Transportation is responsible for maintaining such bridges and operating those with movable spans. The Coast Guard checks to make sure that horizontal and vertical clearances over the waterway conform to standards, bridge navigation lights operate, right of way is given to marine traffic and order is maintained on the waterway. The Department of Transportation should advise the Coast Guard of any upcoming maintenance activities which will affect the waterway or marine traffic on the waterway.

3.5.10. RAILROAD COMPANIES

Where roads and railroads intersect at grade, the Department of Transportation maintains all of the pavement except from end-of-tie to end-of-tie unless otherwise specified in an agreement between the Department and the railroad. Regulatory signs, flashing lights, gates, or other signals for roadway traffic are maintained by the railroad company. If such signs, signals or pavement are in need of repair, the District Engineer should telephone the nearest office of the responsible railroad company. Advance warning signs are maintained by the Department. At railroad crossings with grade separation, the Department of Transportation maintains State highway structures over railroads. If the State Highway goes under the railroad, maintenance responsibility is decided by an agreement for each case. This is true even if the State builds the structures. On Interstate highways, however, all grade separation structures are maintained by the State. Responsibilities and requirement for removal, adjustments, and/or improvements to crossings are covered further in the Department's Guidelines For Operation.

3.5.11. UTILITY COMPANIES

Under Alabama law, utility companies have the right to reasonable use of the State right-of-way, but a permit is required. The State Maintenance Engineer or Division Engineer regulates such permits as discussed in Chapter Four, PERMITS.

3.5.12. WRECKING AND TOWING SERVICES

State-owned wreckers are used primarily for State vehicles and rarely to open the highway after a motor vehicle accident. Normally, private wreckers are called by the law enforcement officer at the scene of an accident. The owner of the vehicle to be towed may choose the towing company if desired. When a maintenance crew encounters an accident and a State Trooper is not on the scene, they should call the District Office and request that a Trooper be sent to the location. The Trooper will call for wrecker services as required. Wrecker services are required by Alabama law to remove all accident debris from the scene before leaving. However, the Department has a responsibility to assist, or to clear the travelway for the safe movement of traffic.

3.6. SPECIAL WORK AUTHORIZATION

The Transportation Director may authorize the use of Department of Transportation personnel and equipment in performing work upon areas adjacent to public highways, provided that such work is consistent with other duties and functions of the Department, is directly or indirectly beneficial to the public highway and no work will be performed, services rendered or items furnished by the Department except by a Special Work Authorization (SWA) approved by the Transportation Director, regardless of whether the property owner is a county, municipality, other State agency, institution, business or private citizen.

Special Work Authorization, Form SJ-128, must be signed by the requesting agency and submitted to the Department for approval. Work to be performed under an SWA will be estimated as to amounts for labor, materials, equipment and Departmental overhead. The request will specify in detail the purpose of the SWA. A check to cover estimated cost must accompany Form SJ-128 to Montgomery. Work performed under SWA will be done when State forces, equipment and materials are available in the vicinity of SWA request. Special Work Authorizations shall conform to the latest Guidelines for Operation established by the Department.

If after work has started, it is obvious that the actual cost will exceed the original estimate, the applicant will be notified immediately. Work should not continue until an additional check, to cover the revised estimated costs, has been received by the Department.

Upon completion of the work authorized, notice of such completion should be mailed to the Bureau of Accounts and Finance in Montgomery. Any overpayments will be returned to the applicant or the applicant will reimburse the Department for any overrun of estimated cost.

3.7. STATE FORCE CONSTRUCTION

To obtain funds to construct State force construction projects, a Budget Allotment Request, Form F-7A, must be submitted to secure funds not covered by routine or other maintenance projects. The form should describe, on the reverse side or an attached sheet, the quantity, unit description, unit price and total amount for each item of work to be performed. A sketch showing the location of the proposed project should also accompany the form. The form and attachments must be submitted for approval by the State Maintenance Engineer and the Transportation Director. The Director of Transportation Finance must also approve the obligation of funds.

No work will be performed on the proposed project until approved copies of Form F-7A are received in the Division Office.

3.8 OTHER REIMBURSABLE MAINTENANCE

When State equipment, roadway and bridge appurtenances, and other State property are damaged or destroyed, through fault or negligence of operators of privately-owned vehicles, the owner of the vehicle is liable for the cost of damages to State equipment or property. In such cases, the Legal Bureau of the Department may assist the Divisions in the collection of funds due the Department for necessary repairs. Procedures for reporting damage to State property are discussed in Section 12.5.

3.9 MAINTENANCE CONTRACTS

The Department of Transportation may enter into contracts with any county, municipality, corporation or individual to do any work involving repair or maintenance of roads and bridges in the State. Such contracts are subject to the same rules and regulations as road and bridge construction and must be approved by the Transportation Director and the Governor.

Normally, routine maintenance and improvements are performed by State forces and, at some locations, convict labor. However, in some cases, it is convenient and desirable to engage contractors to perform certain routine maintenance and improvements. Examples of such cases would include unavailability of State maintenance personnel to perform the maintenance and improvements because of existing workload, additional personnel and/or equipment requirement or specialized knowledge or experience required. Types of work done under contract include resurfacing, centerline striping, guardrail repair, fence repair, sweeping, vegetation management, snow and ice removal, rest area appurtenances (such as air conditioning, heating, and plumbing), and emergency work.

Contracts for equipment rental and/or operators for snow and ice control and emergency work may be handled at the Division Offices with prior approval by the State Maintenance Engineer, Finance Director and Transportation Director.

3.10. SAFETY REST AREA FACILITIES

The Department of Transportation maintains rest areas and welcome centers for the safety and convenience of the motoring public. This service is provided not only for residents of Alabama, but for visitors from other states as well. For this service to be of value, these facilities must be kept neat and clean and rules must be observed.

The amount of attention required to adequately maintain these facilities varies with the type of facility and the amount of usage. Usage varies with season, time of week and type of highway.

Levels of service required for rest areas and welcome centers are described in Chapter Six, MAINTENANCE SERVICE LEVELS.

Rest area facilities are intended for short term off-the-highway usage by motorists for resting, eating, consulting maps, viewing scenery, etc. In order for all motorists to have reasonable access to such facilities, any activity which tends to monopolize or restrict the availability of these facilities, such as overnight parking, camping, club meetings, household garbage disposal, etc., is prohibited.

Open fires are not allowed, except for charcoal fires in grills provided for this purpose and portable charcoal or gas grills.

Dogs or other pets are not permitted to run free at facilities. Dogs must be kept on a leash and walked in designated areas or along the fence or boundary of the facility.

Livestock, such as horses, cattle, sheep, goats, swine, etc., will not be permitted out of vehicles and on the grounds of the rest area facilities at any time. Livestock must remain in the hauling vehicle or trailer at all times. Even if the livestock remains confined to the hauling vehicle or trailer at all times, the rest area attendant may decide that the vehicle should be moved out of the rest area facility as soon as possible due to conditions such as weather, high use of the facility, or distractions and odors caused by the livestock.

Exotic animals and birds, also including and identified as "circus" animals, such as tigers, bears, lynx, mink, raccoon, eagles, hawks, etc., must remain in their appropriate transporting cage or confining structure at all times.

Hunting or use of firearms at rest area facilities is not permitted. Rest area attendants should contact appropriate law enforcement officials to report vandalism, acts of violence, disorderly conduct and other acts which degrade the facilities or affect the safety of users of the facilities. All incidents of this kind should also be reported to the District Engineer.

3.11. DISPOSAL OF LITTER

Litter and other debris collected by maintenance personnel as part of their maintenance work shall be disposed of in accordance with all State laws and local ordinances. When suitable disposal areas are not available on State-owned right-of-way or land fills, the Department may enter into a contractual or purchase agreement with a local agency or private business for the use of their facilities or services. These agreements shall set the method of payment, if payment is required, in terms of the rate per load or unit weight. The Department shall not utilize any disposal facilities not owned by the State until a written agreement is obtained if payment is required.

3.12 TUNNEL AND BRIDGE OPERATIONS

Tunnels and bridges in Alabama are extensions of the highway system and includes those structures which are under, across or over bodies of water. As such, the usual

maintenance requirements for highways apply, plus some additional maintenance requirements because of the special nature of these facilities. In addition to Alabama highway laws, there are Federal rules and regulations of the U.S. Coast Guard, the Federal Highway Administration, and U.S. Army Corps of Engineers which may apply.

Maintenance activities for these facilities should be directed toward preserving the capital investment, structural integrity, and comfortable and convenient riding conditions. Structural integrity and safety are of primary concern and should have priority over comfort and convenience.

Although routine engineering inspections are conducted periodically, attendants and operators of tunnels and movable span bridges must be constantly alert for indications of possible structural problems, e.g., seepage, cracking, rusting, excessive vibrations and accident damage.

Any unusual or questionable condition should be brought to the attention of the operator or attendant's supervisor or District Engineer immediately. If there appears to be immediate danger of structural failure, traffic operations should be stopped and suitable roadblocks and detours set up. Notify the Division Engineer and the Bureau of Maintenance to determine the necessary repairs.

Routine maintenance operations should be conducted during periods of the day when the traffic volume is lowest. Warning devices should be used to alert motorists of maintenance operations under way and to protect maintenance personnel.

Bridge tenders must operate all movable span bridges in accordance with rules and regulations of the United States Coast Guard (See Code of Federal Regulations Title 33 Navigation and Navigable Waters). Bridge tenders must be thoroughly trained for proper, safe operation of moveable span bridges to prevent accidents as well as unnecessary delays of highway and water traffic. The proper sequence of operation and time lag of warning devices, gates and spans must be understood. This is true even for bridges with automatic controls, because of the possibility of mechanical or electrical equipment failure. Bridge tenders should be constantly alert for malfunctions of bridge equipment. If necessary, traffic should be stopped until repairs are made and safe operations can be resumed. The bridge tender's supervisor or District Engineer should be advised of any bridge problems which affect highway or water traffic.

If the bridge becomes inoperative or is closed for repairs, the Coast Guard should be advised by the Division Engineer of the starting time and approximate duration of the closure. If highway traffic must be prohibited, suitable detours should be set up prior to closing or, in an emergency situation, as soon as possible after the closure. The Bureau of Maintenance and the Division Engineer are to be notified immediately when emergencies occur.

3.13. SAFETY MEETINGS

Each District should discuss safety at least once a month with maintenance personnel. These meetings do not need to be lengthy meetings, and may be integrated into other topics. These meetings should be documented and files kept at the District Office. Copies of these reports are forwarded to the Division Office.

The District Engineers should report to the Division Safety Officer on their safety posture at routine staff meetings.

3.14. MAINTENANCE WORK METHODS TRAINING

A maintenance training program is available to train maintenance personnel in the methods, procedures and techniques for maintaining Alabama highways, roads, streets and bridges in a satisfactory condition.

3.14.1. AVAILABLE COURSES

Alabama's Maintenance Training Program provides courses which cover various maintenance activities. The following subject areas are a part of the activities covered by these courses:

roadway surface care,
roadside maintenance,
vegetation management,
safety,
bridge inspection,
traffic control for work zones,
traffic signing,
traffic signals,

drainage maintenance, and
hazardous debris control.

Maintenance Training Courses are periodically reviewed, updated, and improved. Individuals may contact the Maintenance Bureau for the latest training material available for the work area in question.

3.14.2. TRAINING SESSIONS

It is important to use the training materials on a regular basis to provide guidance to personnel for maintaining Alabama highways in a satisfactory condition. Each of the field divisions has a complete set of the maintenance work methods training courses and audio-visual equipment for use with the courses. Each of the courses consists of a tape-recorded text and a set of color slides to match the text.

The Division Maintenance Engineer or individual responsible for division-wide training, should schedule maintenance training sessions throughout the year during slack workload periods. All District Engineers, Highway Superintendents, Foremen, Crew Leaders and other maintenance personnel should participate in these training sessions at some time.

All newly appointed maintenance personnel should be scheduled for participation in maintenance work methods training sessions as soon as possible after their appointment. This includes administrative, supervisory, and crew personnel.

3.15. MAILBOX TURNOUTS

The latest edition of "A Guide For Erecting Mailboxes on Highways" published by the American Association of State Highway and Transportation officials has been adopted by reference for use by the Alabama Department of Transportation.

Turnouts of adequate size with an all-weather surface should, when feasible, be provided at mailbox and newspaper box locations to ensure servicing and patron retrieval of mail. These turnouts are to be designed, insofar as possible, using the latest design criteria as provided by the Alabama Department of Transportation.

3.15.1. LOCATION

The location of these facilities should be in compliance with the latest edition of "A Guide For Erecting Mailboxes on Highways."

All boxes should be placed only on the right-hand side of the highway in the direction of travel of the carrier and be placed, if possible, so that vehicles are completely removed from the traveled way when using the box.

Mailboxes shall not be located inside access control limits of freeways. Where frontage roads are present, boxes should be located along such frontage roads.

In urban and suburban areas where the post office has established delivery routes that have curb and gutter sections, mailboxes should be located with the front of the box approximately 200 millimeters to 300 millimeters back of the face of the curb.

3.15.2. SUPPORTS

Mailboxes should be mounted and firmly attached to supports that will yield or collapse upon impact by a vehicle. Mailbox supports should, with a minor qualification, be no more substantial than required to resist service loads and reasonably minimize vandalism.

Mailbox supports should be embedded no more than 600 millimeters into the ground and shall be one of the following type:

A. Nominal 100 millimeter x 100 millimeter square wood post
B. 100 millimeter round wood post
C. 38 millimeter to 50 millimeter standard steel or aluminum pipe

Metal posts should not be fitted with an anchor plate. However, an anti-twist device that extends no more than 250 millimeters into the ground is acceptable.

Multiple mailbox installations, such as neighborhood delivery and collection box units (NDCBU) must meet the same criteria as do single mailbox installations. Refer to latest edition of "A Guide for Erecting Mailboxes on Highways" published by the American Association of State Highway and Transportation Officials.

The desirable mounting height for mailboxes is approximately 1.0 meter to 1.2 meters above the mail stop surface. When it is necessary to use a cantilever type support, it should be of a design that will allow the horizontal member to rotate about the support post with a minimum of resistance if struck.

Mailbox supports which do not meet the above criteria should be considered as an encroachment and the mailbox owner notified in accordance with the Department's procedure for encroachments. The owner shall have the responsibility of getting the mailbox support into conformance.

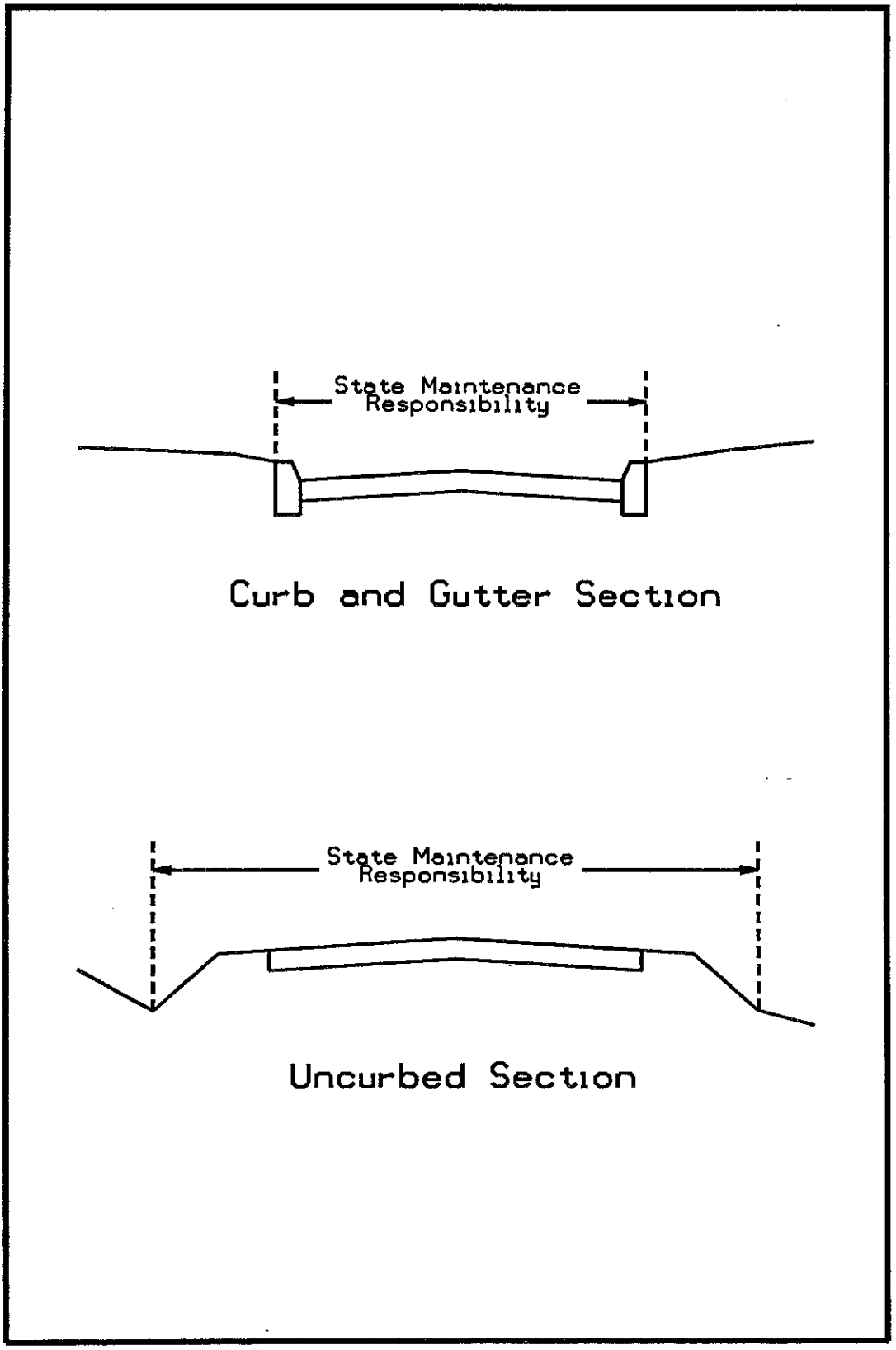

FIGURE 3-1 Limits of Responsibility for Municipal Connecting Links

Chapter Four

PERMITS

4.1 INTRODUCTION

The Alabama Department of Transportation may authorize access to the right-of-way and the traveled way, as well as the use of the right-of-way, under highway laws, and Rules and Regulations promulgated by the Department. These authorizations include, but are not limited to the installation and locations of turnouts and median crossovers; the location and placement of utilities; location and placement of solid waste containers; control of junkyards; outdoor advertising; roadside plantings; grading and landscaping, vegetation management improvements, changes to drainage facilities, and the regulation of movement for oversize and/or overweight vehicles on the State Highway System.

4.2. TYPE OF PERMITS

The Department of Transportation issues various types of permits and authorizations for use of the highways and right-of-way and for obtaining access to the right-of-way. Authorization may involve (1) a formal Permit; (2) a letter of Authorization; or (3) a General Agreement. Work performed within the limits of the right-of-way should be authorized by one or more of the above. No work of any type should be performed within the limits of the right-of-way without the proper authorization.

Permits executed by the Department should be issued to the owner (applicant) only.

In order to insure public safety and to protect the public's investment in the State Highway System, it is important that design work, where confidence must be placed in the designer, and the design procedures be performed by a qualified Registered Professional Engineer, Registered Architect, Landscape Architect or other duly registered professional doing such work within the pervue of those professional's expertise duly registered in the State of Alabama and charged with the protection of the public's safety, health and welfare.

For permits and agreements that involve structure design, drainage evaluation, environmental evaluation or any other work involving advanced engineering technology, plans and/or drawings, must bear the seal of a Registered Professional. Any work performed on State right-of-way involving the practice of Engineering, Architecture or Landscape Architecture with costs in excess of $20,000.00 (twenty thousand dollars) shall be performed and bear the seal of a professional licensed in the field of proposed work or as may be provided by the applicable Code of Alabama. For Permits and Agreements that do not involve a high degree of engineering expertise, the plans and drawings may be done by nonprofessionals. An example is one dimensional layouts that essentially involve showing measurements and distances and require little or no engineering calculations.

4.2.1 SURETY OR PERFORMANCE BOND

The cash deposit, certified check or Surety Bond required as a part of the Permit should normally cover the total amount of work which is to be performed within the limits of the right-of-way.

Divisions may require lesser amounts. The amounts set for bonds should be sufficient to ensure that all work will be performed and satisfactorily completed in accordance with the Permit requirements.

The amount of the assurance required as a guarantee of performance shall be in the form of (1) cashiers check, (2) certified check, (3) money order made payable to the "Alabama Department of Transportation" or (4) Surety Bond naming the Alabama DOT as obligee.

Performance bonds furnished and accepted as a guarantee of completing work performed within the right-of-way shall be submitted on the Department's official Form BM-174. Performance bonds shall indicate the owner (applicant) as the principal.

The following sections identify the types of access and use that require authorization and the type of permit required.

4.3 TURNOUTS

4.3.1 INTRODUCTIONS

Turnouts are access points to public roads from private, publicly owned and commercial facilities. Since turnouts affect drainage and safety characteristics of the highway, a permit is required to ensure that the location and construction methods are acceptable. Individuals or businesses which require access to State highways must apply for a permit by submitting a completed application for Right to Construct Turnout, to the District Engineer.

Turnouts should be regulated as to width of entrance, radii, placement with respect to property lines, intersecting streets and crossovers, angle of entry, vertical alignment, positive drainage and number of entrances to a single property. For major developments, turnouts should be regulated based upon review of the overall development plans and not just initial phases of an area to be developed. "Out Parcels" within a major development area should be served internally so as to limit the number of required turnouts. Turnouts including their radii should be constructed within the limits of the owner's (applicant) property frontage projected at right angles to the roadway center line.

When the District Engineer is satisfied that the proposed turnout conforms to current specifications and requirements of the Department, the application is submitted to the Division for approval, except for residential entrances, drives to farm fields and small churches (Form BM-111-A).

4.3.2 PRIVATE ENTRANCES

The Department of Transportation will grant permission to the requesting owner (applicant) to cut the curb, if one exists, and cut or fill a reasonable driveway area to the right-of-way line for residences only. Property owners will furnish the necessary sidedrain pipe at their own expense. All sidedrain pipe furnished shall be a minimum of 375 mm in diameter and conform to the size, condition and specifications as required by the Department. Pipe furnished must be of standard manufacture, and not improvised, such as metal barrels. Property owners must also furnish side-drain pipe at their own expense whenever it becomes necessary to replace the original installation due to deterioration, etc.

For each individual residence, the Department may install pipe and backfill for one driveway up to 9 m wide. This includes drives to farm fields and small churches.

Pipe end treatments will be provided by the Department for one driveway only as described above. Pipe end treatments shall conform to the Department's latest Guidelines for Operation.

If the owner (applicant) requests, and receives approval from the Department for an additional driveway, a Form BM-111-B will be executed whereby the owner (applicant) will be responsible for the complete construction and total cost of its installation.

The Department of Transportation may pave a portion and perform minor maintenance of driveways in accordance with the Department's Guidelines for Operation. When it is deemed to be in the best interest of the Department for the protection of the investment in the highway, the entire driveway may be paved and maintained to the limits of the right-of-way. Residential entrances should meet current Alabama Department of Transportation design criteria.

4.3.3 COMMERCIAL ENTRANCES

For business, public, industrial and commercial establishments, the owner (applicant) will furnish necessary materials and construct the turnout(s) in accordance with approved permits. The Department may require and/or provide inspection to insure compliance with the approved permit.

Commercial turnouts will be approved and a permit issued when all requirements of the Department have been satisfied and a proper surety or the Department's performance bond (Form BM-174) in the specified amount has been received from the owner (applicant) by the Division Engineer. The surety is to be held at the Division level and returned to the owner (applicant) after inspection and final acceptance of the work covered by the permit.

All improvement costs associated with the entrance, such as pipe, pipe end treatments, inlets, headwalls, curbs, curb and gutter, paving, etc., are to be paid for by the requesting owner (applicant). Minor maintenance of commercial entrances may be performed by the Department within the right-of-way limits.

Improvements to existing entrances, such as paving of unpaved drives, resurfacing of drives or major extensions of driveways, are governed by the same regulations as a new entrance, including the application and issuance of a permit.

4.3.4 SUBDIVISION STREETS

The cost of constructing entrances and other access facilities to streets developed as part of a subdivision shall be borne entirely by the developer. The Department may perform minor maintenance on these facilities within the right-of-way limits.

4.4 MEDIAN CROSSOVERS

4.4.1 AUTHORIZATION

Regulation of median crossovers on existing multi-lane divided highways with partial or no control of access is necessary to provide reasonably convenient access to adjacent roadside property in a uniform manner. Applications for median crossovers are to be submitted to the Maintenance Bureau through the Division Engineer. Each application shall contain the following:

1. Completed Form BM-166, Application for Right to Construct Median Crossover.
2. Drawing of proposed crossover showing location and distance (nearest tenth of a meter) to existing crossovers and intersections and points of access to roadside property. Measurement shall be center to center of existing and proposed crossovers.
3. A surety or performance bond.

Requests for median crossovers will be evaluated on an individual basis by the Department.

4.4.2 SELECTION CRITERIA

Median crossovers may be approved and construction authorized if one or more of the following criteria apply:

1. Intersections with public roads and streets
2. Access points for fire stations, hospitals and other emergency facilities
3. Other crossover authorizations are to be

based on the following:

a. Distance to nearest crossover after considering following factors
b. Estimated number of times used each day
c. Stopping sight distance
d. Traffic conflicts resolved by the installation of a crossover
e. Traffic volumes
f. Speed
g. Median width
h. Traffic conflicts created by the installation of a crossover
i. Traffic movements created by the installation of a crossover

4.4.2.1 DISTANCE BETWEEN CROSSOVERS

Evaluation and authorization of crossovers based on the distance to the nearest crossover are regulated by the following criteria:

1. Rural or Low Traffic Density Area:

a. 180 m minimum distance between center points of crossovers.
b. 305 m minimum distance between center points of crossovers where service roads exist.
c. 360 m minimum distance between center points of crossovers for residences.

2. Urban or High Traffic Density Area:

    a. 90 m minimum distance between center points of crossovers.
    b. 180 m minimum distance between center points of crossovers for residences.

4.4.2.2 CONSTRUCTION CRITERIA

Construction of authorized median crossovers should be in accordance with Department policies and guidelines as follows:

1. Turn lanes shall be provided for crossovers at high traffic generators such as streets, roads, businesses, commercial facilities, public facilities, industrial facilities and complexes, shopping centers, housing complexes and trailer parks.

2. Crossovers should not be permitted in medians of insufficient width to protect the turning vehicles from traffic in the through lanes. Crossovers should not be permitted within the limits of turn lanes provided for driveways, street and road intersections.

3. Median crossovers and related left turn lanes and tapers should be designed and installed in accordance with criteria contained in Standard and Special Highway Drawings printed and published by the Department.

4. The need for signalization where median crossovers are constructed at entrances to high traffic generators, such as, but not limited to, city streets, roads, shopping

centers and housing complexes, will be determined according to criteria in the Manual on Uniform Traffic Control Devices. Related cost of signalization shall be borne by the requesting agency or developer in accordance with the Department's Guidelines for Operation.

4.5 SERVICE ROADS

Service roads should be required where the adjacent areas are developing as heavy traffic generators. These service roads may be constructed beyond the right-of-way or within the right-of-way dependent upon the availability of adequate space.

Service roads constructed within the right-of-way by a developer shall be built to the alignment, grades and typical sections either furnished or approved by the Department.

The construction cost of requested or required crossovers, turn lanes, and service roads shall be borne by the requesting agency or developer.

4.6 AUXILIARY LANES

Acceleration lanes and/or deceleration lanes with adequate storage areas are required to be built as part of the entrance(s) for traffic generators, such as but not limited to, shopping centers, trailer parks, subdivisions, schools, commercial establishments, businesses, public facilities, industrial facilities and complexes and other traffic generating establishments or areas. Construction requirements for auxiliary lane improvements required or requested as a part of permits should be based on the following: (1) location, (2) highway facility, (3) traffic volumes, (4) speed, (5) type facility to be served, and (6) signal cycle lengths, whether local or part of a system. The geometric design for auxiliary lanes should meet current Alabama Department of Transportation design criteria as indicated on current standard drawings.

Minimum standards have been set by the Department for the construction of deceleration lanes for both left and right turning movements. The intent in using these minimum standards is for areas and conditions such as minimal number of left turn movements, geometric

restrictions, posted speed, intermediate crossovers, etc. The construction of these type lanes should be confined to speeds of less than 70 km/h or under one of the conditions stated above. The taper ratio should be a minimum of 1:15 with a minimum deceleration and storage length of 35 m.

The above minimum standards are to be used in areas and under conditions described and **are not** to be used or substituted for the normal requirements for auxiliary lanes.

The following table gives design lengths for both left and right speed change lanes for 70 km/h and above. This chart should be used under normal conditions.

Left turn lanes constructed on a two lane, two way facility should be constructed with taper lengths sufficient to allow the thru traffic to flow thru the area at the posted speed. For posted speeds equal to or greater than 70 km/h, length of taper **(L)** equals the posted speed **(S)** multiplied by the offset **(W)**, **L = SxW**. For posted speeds equal to or less than 60 km/h, the length of taper **(L)** equals the offset **(W)** multiplied by the posted speed **(S)** squared, then divided by **100**, or **$L = WS^2/100$**.

4.7 STOPPING SIGHT DISTANCE

When considering approval of permit requests for the installation and construction of new intersections, driveways turnouts or crossovers, stopping sight distance evaluations should be based on the posted speed limit and minimum acceptable distances as established in accordance with criteria contained in the latest adopted edition of the AASHTO Policy on Geometric Design of Highways and Streets.

Turnouts and crossovers should be situated within the limits of the applicant's property so that adequate sight distance is provided for each affected direction of travel.

The following criteria will be used in determining stopping sight distance:

4.7.1 STOPPING SIGHT DISTANCE/TARGET HEIGHTS

Height of Driver's Eye - 1070 mm
Height of Object - 150 mm

4.7.2 PASSING/INTERSECTION (SIGHT TRIANGLE) SIGHT DISTANCES

Information, including illustrations, tables and formulas for both passing and intersection (sight triangle) sight distances may be obtained from the latest adopted edition of the AASHTO Policy on Geometric Design of Highways and Streets.

4.8 DRAINAGE FACILITIES/STRUCTURES

Quite often individuals, commercial establishments, industrial facilities or complexes, towns, cities or counties desire to make improvements to the Department's drainage facilities due to (1) aesthetic considerations or (2) are required by the Department due to development to add or make improvements to the highway drainage facilities. A "Special Agreement for the Installation of Drainage Structures on Highway Right-of-Way" may be executed between the individual or agency and the Department for this work, or it may be included as part of work covered by a turnout permit or a special agreement.

In no case should drainage from beyond the right-of-way limits be directed toward the roadway.

Where drainage from beyond the right-of-way is by nature, flowing onto, along or across the right-of-way; individuals or agencies are responsible for any increase in flow brought about by changes or development. Any increase between pre-development and post development conditions are normally handled by either (1) retention/detention off the right-of-way, or (2) improvements to drainage facilities within the limits of the right-of-way. The Department's drainage features should not be utilized for retention/detention of off right-of-way drainage.

When improvements are made to drainage facilities within the limits of the right-of-way, it shall be the responsibility of the individual or agency to secure the necessary permission to increase the down stream flow. The Department will not issue any permit for improvements to facilities within the right-of-way until this permission is received and the Department is held harmless.

Permits or agreements which involve complex drainage situations should be referred to the Design Bureau's Hydraulic Section for evaluation.

Drainage which affects the right-of-way shall be designed using criteria outlined in the Department's Hydraulic Manual. Drainage design should

be based upon overall development plans and not just initial stages of an area to be developed.

4.9 HAY CUTTING

The Department may utilize various pesticides in conjunction with its Roadside Vegetation Management and Soil Erosion Control Programs. These pesticides which may include herbicides and insecticides are used under Federal laws, rules and regulations under a "non-cropland" designation. Because cutting of hay for forage use in areas treated under these pesticide label restrictions is illegal, the issuance of hay cutting permits cannot be allowed. **EXCEPTION** - Hay cutting permits may be issued in areas not treated with subject pesticides and only where the permittee has property adjacent to and contiguous to subject Department right-of-way. Hay cutting should not be allowed in areas designated as "within the clear zone."

4.10 UTILITIES

Public utility organizations have various degrees of authority by law, to use or occupy the right-of-way of public roads and streets. The Department of Transportation, however, has the legal authority and responsibility to regulate such use for the protection of the traveling public and the public's investment in the highway.

The use of the right-of-way for utility installations is regulated by the use of utility agreements that must be approved by the Department. The Bureau of Maintenance Permits and Operations Section is responsible for reviewing all requests for utility agreements on roadways under maintenance jurisdiction. The Design Bureau Utility Section is responsible for reviewing utility agreements on Department right-of-way during the design of construction projects.

Utility companies are required to obtain permit agreements for installing new facilities or changing the type, function or location of existing facilities. The review and approval of the permit agreement is based on State Laws and Department policies and standards as presented in the Alabama Department of Transportation Utility Manual. The manual also contains sample copies of permit agreements that are to be used for utility installations.

No permit agreement is required for normal maintenance operations. However, the utility must supply advance notification to the District Engineer of the time, date, and location of the proposed maintenance, service, or repair activity.

Traffic control should be in accordance with the Manual of Uniform Traffic Control Devices. A traffic control plan may be required as part of the permit.

A bond or certified check for the amount established by the Division or District Engineer and sufficient to cover the cost of restoration of the highway features must accompany the request for an agreement or permit. The amount of the bond or certified check must be included in the text of the agreement.

Major utility organizations such as South Central Bell Telephone Company, Alabama Power Company, Alabama Gas Corporation, General Telephone Company, Birmingham Water and Sewer and Southeast Alabama Gas have established general agreements with the Department of Transportation. A general agreement with one of these agencies permits them to install new facilities and perform other required activities on certain highways with Division level approval.

A utility company working under permit should have an inspector on the job at all times.

4.11 SOLID WASTE CONTAINERS

Alabama law requires that rural residences have some place to dispose of their household solid waste without polluting water or air and without destroying the beauty of the landscape. County officials are responsible for carrying out this law in Alabama. In some cases, it is convenient for the counties to place solid waste containers on the State right-of-way. To ensure that the container is designed and located in such a way that a traffic hazard will not result from its placement and use, the county must apply to the District Engineer for a permit. When the District Engineer is satisfied with the design and location, the application is transmitted to the Division Engineer and Bureau of Maintenance for proper approval.

4.12 JUNKYARDS

According to the Highway Beautification Act - Junkyard Control of 1967, no person shall establish, operate or maintain a junkyard, any portion of which is within 304.8 m of the nearest edge of the right-of-way of any Federal-aid Primary or Interstate Highway, without obtaining a license to do so from the Department of Transportation. A nominal license fee is required annually. The policies and procedures for dealing with junkyards are presented in the Department's manual entitled Laws, Rules and Regulations Relating to Operation and Licensing of Junkyards.

4.13 OUTDOOR ADVERTISING

According to the Highway Beautification Act - Outdoor Advertising of 1971 and subsequent acts, the erection and maintenance of outdoor advertising signs, displays and devices within 201.168 m of the nearest edge of the right-of-way of an urban section of a Federal-aid Primary or Interstate Highway and intended to be viewed from these facilities will be regulated by the Department of Transportation.

All advertising signs that can be viewed from a Federal-aid Primary or Interstate Highway within a rural area are also governed by the Department. This is done in order to protect the public investment in such highways, to promote the recreational value of public travel, to preserve natural beauty and to promote the reasonable, orderly and effective display of such signs, displays and devices. Detailed regulatory standards are contained in the Act and in various promulgated Rules and Regulations approved by the Transportation Director. No signs may be erected without first obtaining an approved application for Permit to Erect Outdoor Advertising Sign, Form OA No. 1, from the Department of Transportation. If the sign conforms to the Highway Beautification Act and Promulgated Rules and Regulations, a permit and decal for sign identification will be issued. A nominal fee and required annual renewal will be charged for the permit.

4.14 CHANNEL IMPROVEMENTS/ACTIVITIES

Occasionally, the Coast Guard, the Corps of Engineers, or other Federal agencies perform work on the navigable waterways around State highway structures. The Department of Conservation sometimes changes the alignment of small streams within a watershed district

resulting in changes to drainage characteristics. If such work affects the State right-of-way, structures, or highway traffic; the Department of Transportation has jurisdiction. The agency must obtain a permit from the Department. Provisions of these permits or agreements will be negotiated on an individual basis and approved by the Transportation Director. Dredging or mining operations in or near streams and rivers in the vicinity of Department bridge structures can cause scour and streambed degradation which can lead to structure failure.

Department employees should continuously watch for these operations. If work of this nature is detected, the individuals performing this work should be contacted and made aware of the potential problem. Failure of the individuals to cease work and relocate their operations should be reported to the Maintenance Bureau for their investigation and possible follow-up with the Corp of Engineers.

4.15 ROADSIDE DEVELOPMENT

A high level of visual quality and improved maintenance and safety functions can be achieved through landscaping, grading, forestry, and other related activities. Appropriate roadside development by adjacent property owners, communities, and other governmental agencies is a major opportunity and a natural and logical adjunct to our Highway rights-of-way.

The planning, implementation and maintenance of roadside development projects must meet the following criteria:

1. Proposed improvements must be consistent with the landscape characteristics of the road corridor and adjacent land use, or be of a character that reflects local or regional aesthetics.

2. Proposed improvements must be permitted by the proper agreement/permit issued by the Department. A Grading and/or Landscaping Agreement is to be used whenever proposed roadside work includes any combination of the following:

    a. modification of roadside cross section,
    b. other grading and drainage,

c. irrigation,
d. hardscape (amenities), and/or
e. vegetation planting.

3. Whenever roadside improvements are proposed by clubs, groups, associations or local agencies, a companion "Cooperative Maintenance Agreement" must be issued and endorsed by Resolution of the local political sub-division (city, county, etc.) that agrees to maintain the improved roadside. The District Engineer/Division Engineer may upon review of the proposed work determine that a Cooperative Maintenance Agreement is not necessary due to uninvolved scope or other factors.

4. Permit Agreements proposed for roadside development improvements shall conform to current applicable Guidelines for Operation. Setbacks and other plan criteria will conform to the current edition of "A Guide for Transportation Landscape and Environmental Design" and/or applicable Department's Guidelines for Operation.

5. Permit Agreements shall include detailed, clear and concise working drawings and specifications utilizing standard practice for graphics, dimensions (scale), and validation of base information. Additional pertinent information, graphics, and specifications may be required by the Department. Plans and specifications should indicate type of adjacent land use; topographic features such as slope limits, utility installations, standard cross sections, profiles and contour grading features; in addition to the location of plants, species, sizes and area of occupancy at maturity. Specification for nursery stock, planting, and other types of landscape construction

should be clear and concise and embody the practice and quality of work best suited for the area.

The initial request for a permit shall be forwarded by the District Engineer to the Division Engineer. Whenever necessary, due to the scope of work, the Division Engineer should arrange for a conference between himself or the District Engineer, the Landscape Architect, the Permits and Operations Engineer, and the individual/agency making the permit request. The section of highway right-of-way should be viewed, and prior to any further action on the permit, any discrepancies or necessary modifications to the proposed work should be discussed. This conference may also be used to discuss proposed work in conceptual stages of development.

Necessary approvals and issuance of Permit Agreements will be contingent upon favorable review and recommendation of the District Engineer, Division Engineer, and Maintenance Engineer.

4.16 OTHER ACTIVITIES WITHIN STATE RIGHT-OF-WAY

Any other use of the State right-of-way by individuals or agencies, other than normal vehicular traffic, which affects the capital investment and the convenience, safety and aesthetic values of the public, is prohibited without the expressed permission of the Department of Transportation. This includes work such as taking down or replacing the right-of-way fence, grading and ditching, tree cutting or trimming, or hauling or moving items across the right-of-way at points other than road or driveway intersections. Provisions of the Permit Agreements for this type work should be negotiated on an individual basis. Violations should be reported by the District Engineer to the Division Engineer to determine the appropriate action to be taken.

4.17 OVERSIZE/OVERWEIGHT PERMITS

Vehicles using State highways are limited in length, width, height, and weight in accordance with Alabama Code Section 32-9-20 (1994 Cum. Supp.). If any of the measurements or weights are greater than the legal limits, a permit is required for the vehicle or combination of vehicles to use the State Highway System. Permits are granted by the Bureau of Maintenance Permits and Operations Section. Permitting Authority and Details for these limits can be found in Alabama Code Section 32-9-29 (1975) and various promulgated Rules and Regulations. All

inquiries relating to oversize overweight permits should be referred to the Bureau of Maintenance Permits and Operations Section.

Whenever construction projects or any other situation causes a change in the vertical clearance, horizontal clearance or load carrying capability of a roadway or bridge, or if traffic is detoured, the Bureau of Maintenance Permits and Operations Section should be notified immediately.

4.18 MATERIALS/SPECIFICATIONS/WORKMANSHIP

4.18.1 MATERIALS

Materials used in performing work covered by permit, letter of authorization, or agreement should meet the requirements of the Department's current edition of Standard Specifications for Highway Construction unless approved otherwise within the approval document.

Permanent pavement placed on the right-of-way for an all weather surface should match in-kind with the type material utilized for the adjoining roadway. When curb and gutter is adjacent to a bituminous roadway, concrete pavement may be used to tie to the curb and gutter.

4.18.2 SPECIFICATIONS

Items of work performed within the limits of the right-of-way that are covered by permit, letter of authorization, or agreement should be constructed in accordance with the Department's current edition of Standard Specifications for Highway Construction and the Department's current edition of Special and Standard Highway Drawings.

4.18.3 WORKMANSHIP

All items of work performed on the right-of-way should be constructed in accordance with approved plans and drawings and constructed to location, alignment grades and specifications as approved. All workmanship should be neat in appearance and conform to all applicable requirements, codes and zoning. All work performed should be conducive to good highway construction practices.

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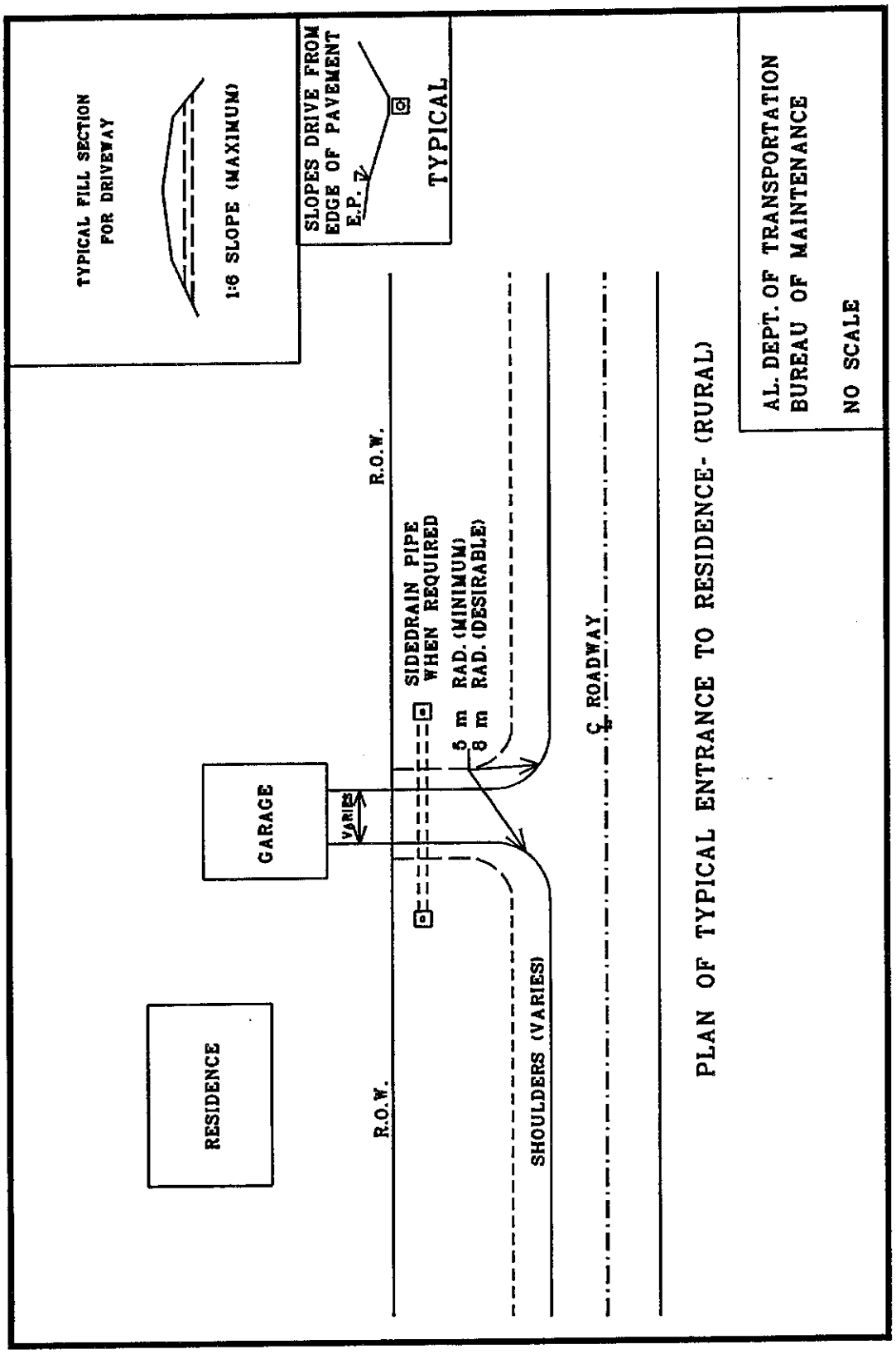


FIGURE 4-1

Residential Entrances

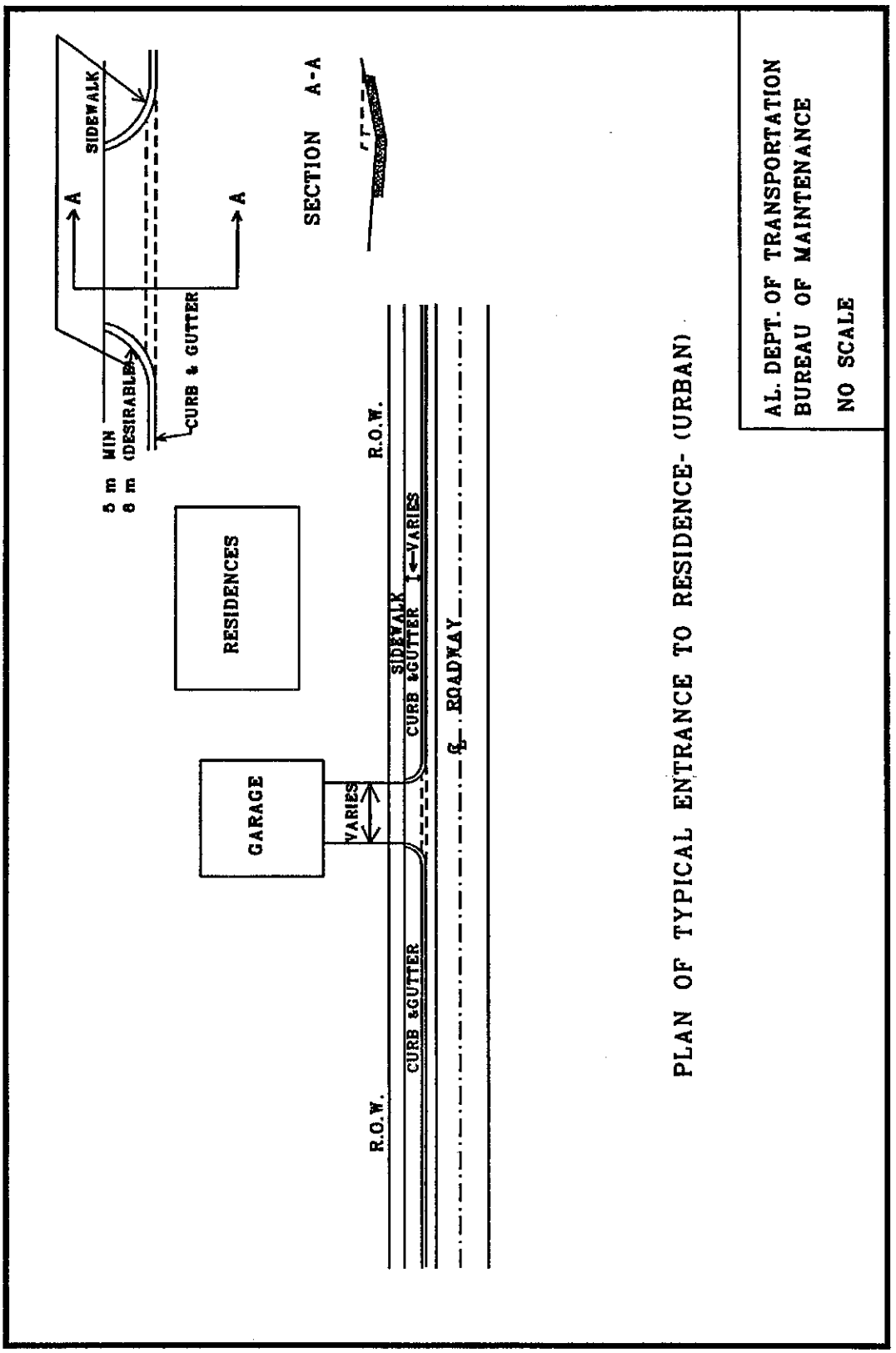


FIGURE 4-2 Residential Entrances

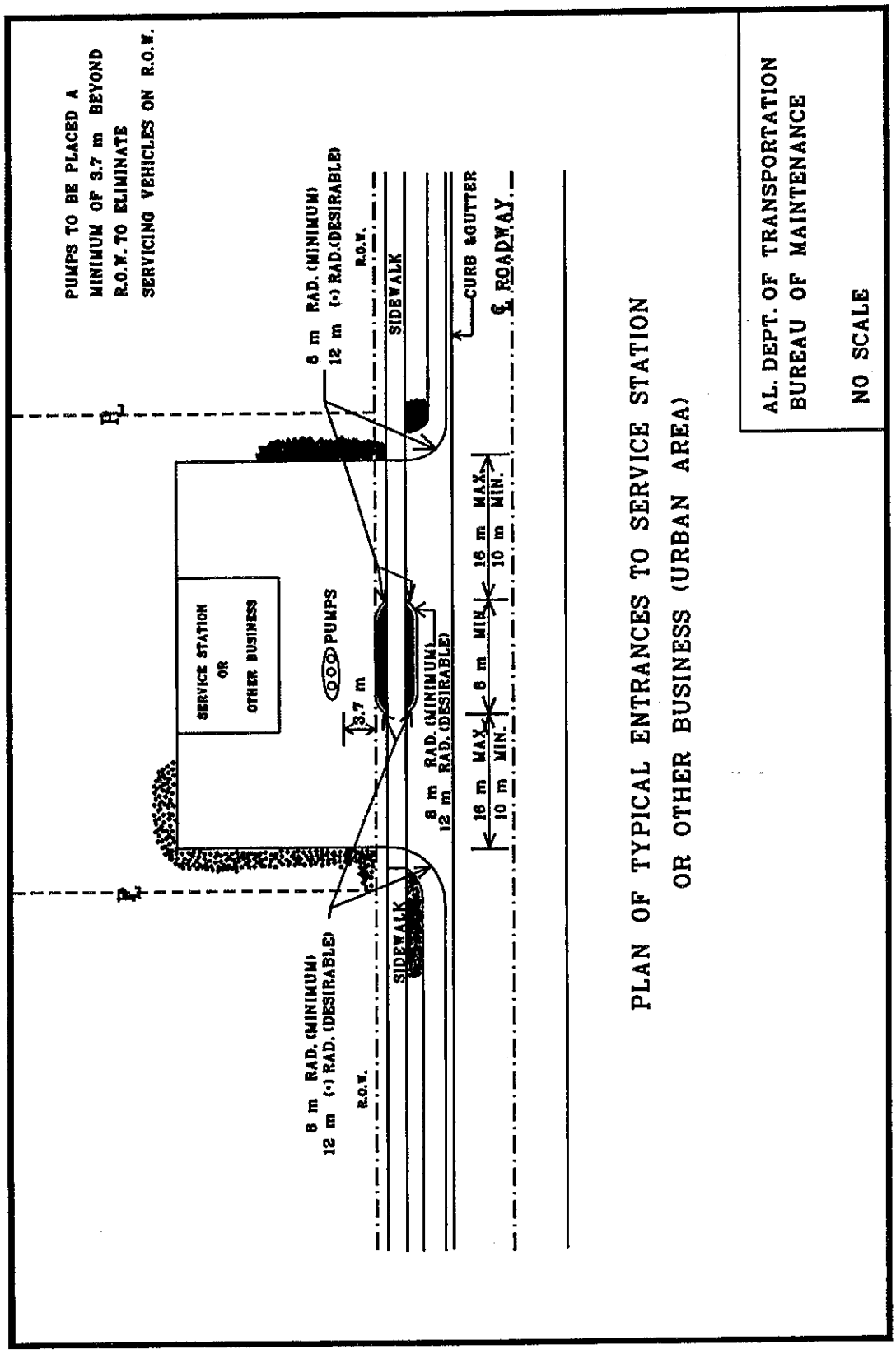


FIGURE 4-3 Entrances to Service Stations or Other Businesses

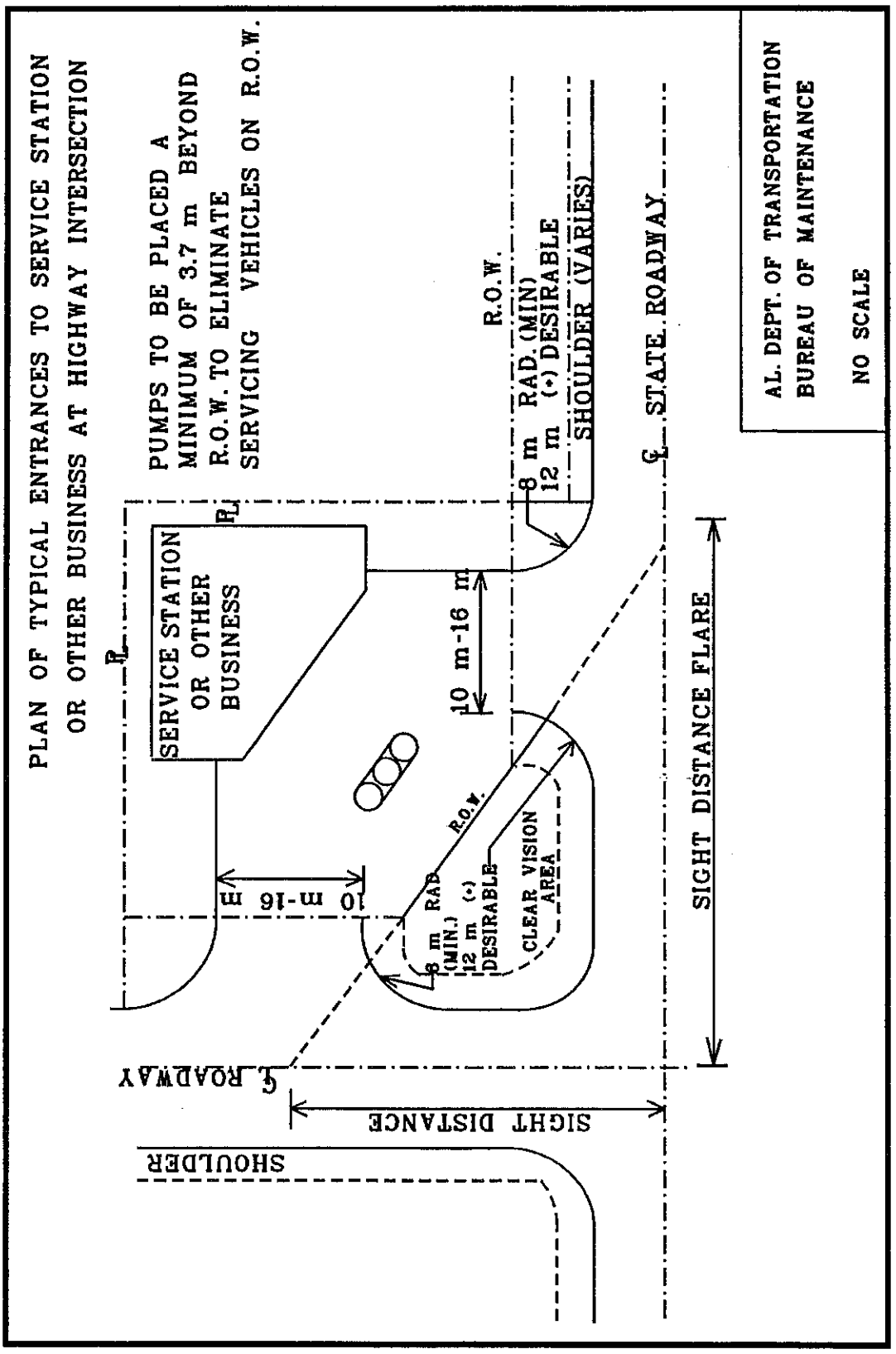


FIGURE 4-4 Entrances at Junction of State Highway and Side Road with Sight Distance Flares

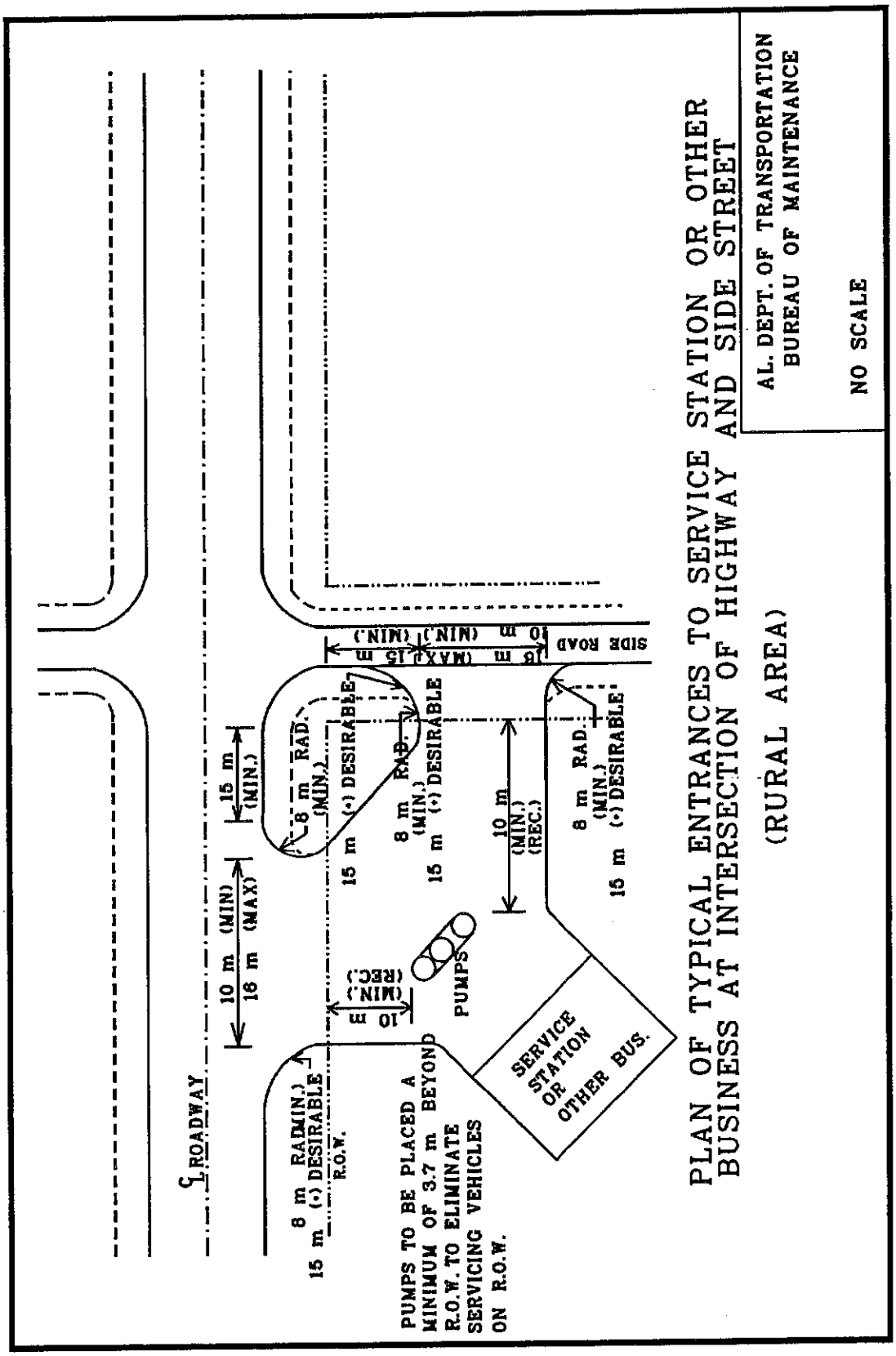


FIGURE 4-5 Entrances at Junction of State Highway and Side Road (Rural) (No Flares)

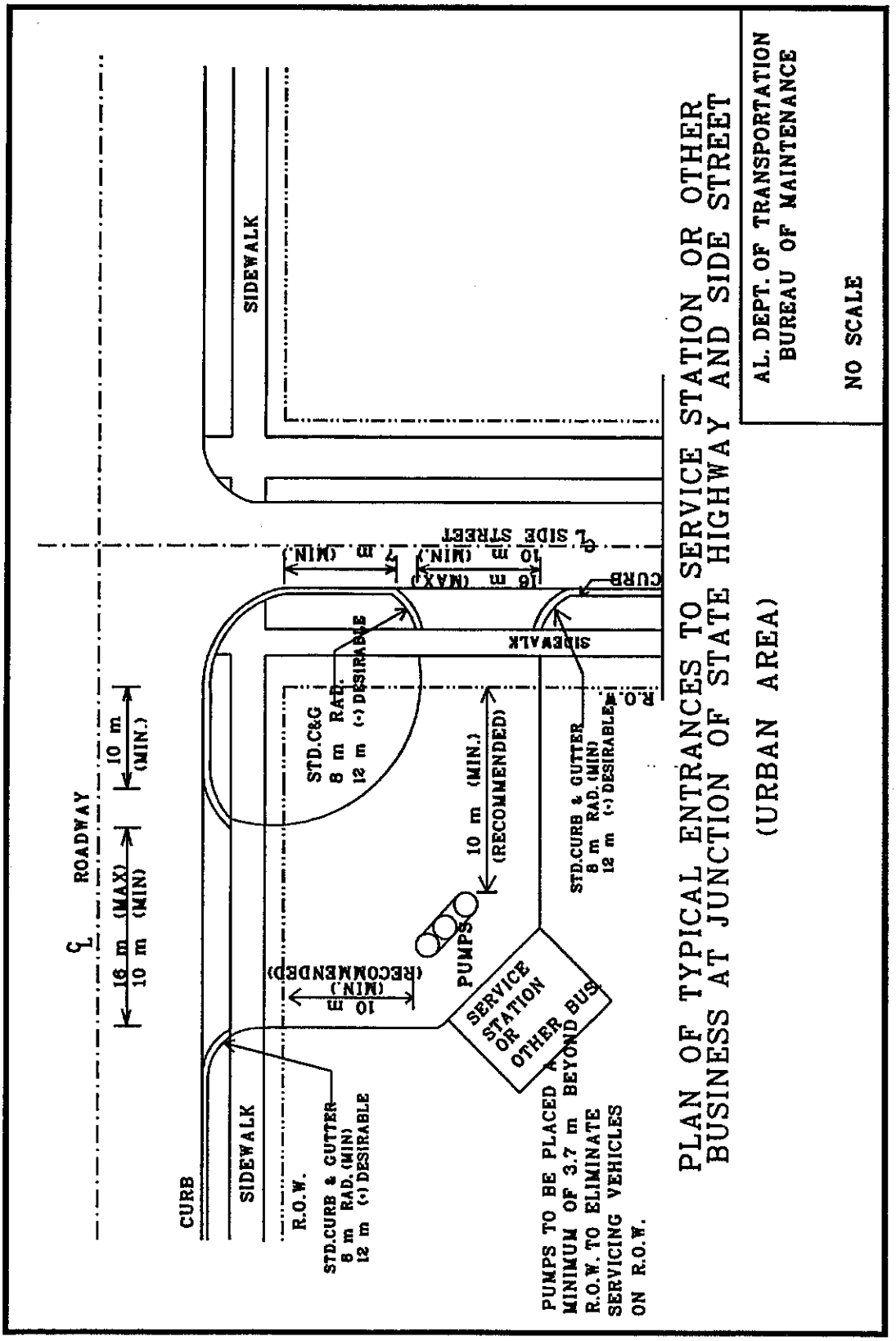


FIGURE 4-6 Entrance at State Highway Intersections and Side Street (Urban) (No Flares)

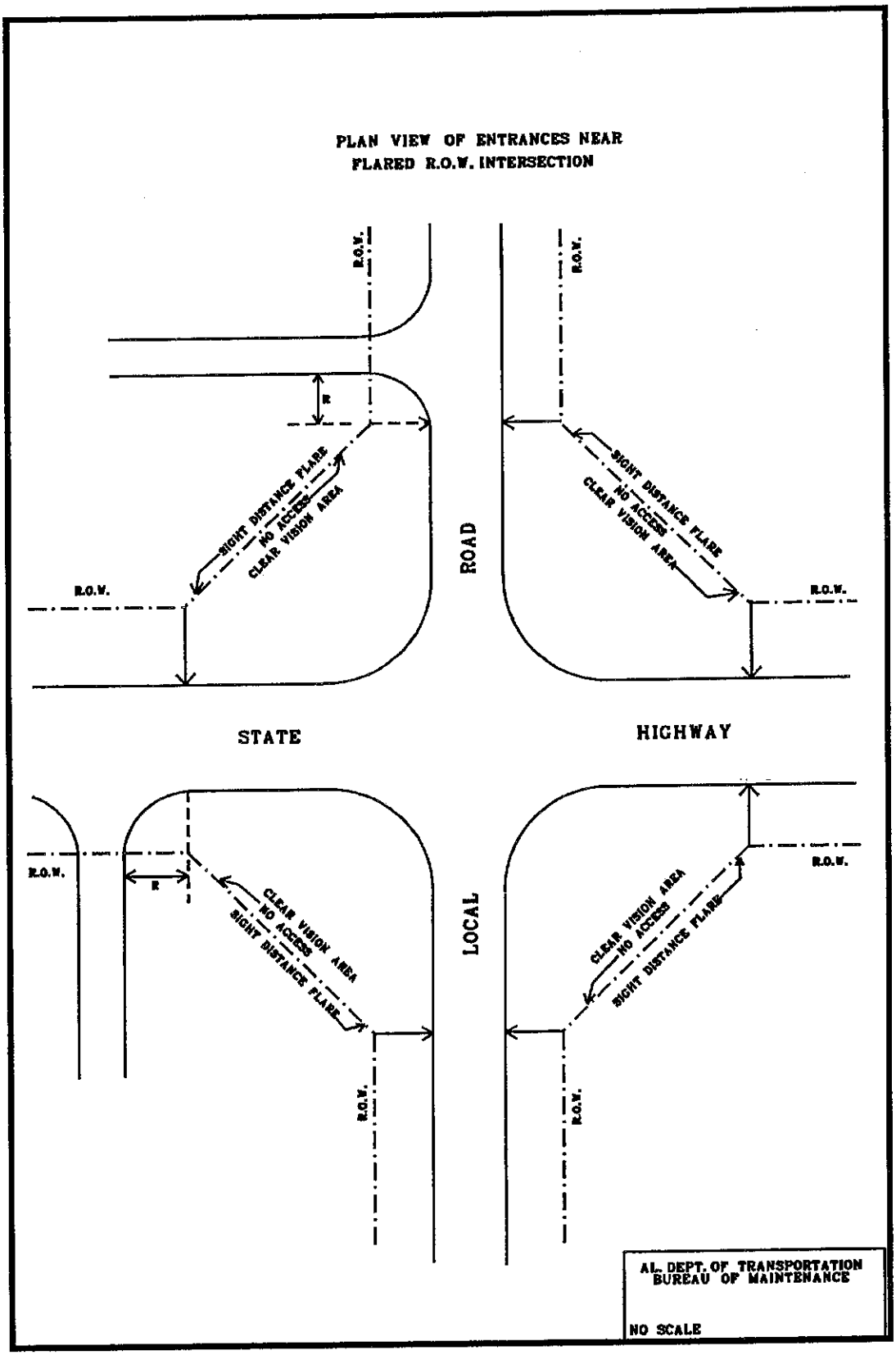
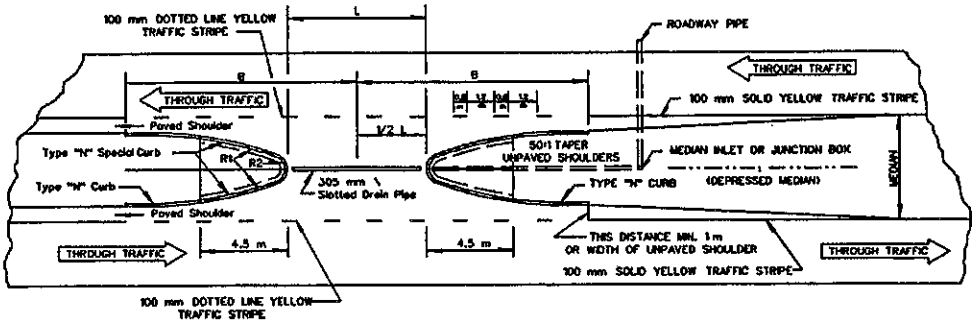


FIGURE 4-7 Entrances Near Intersections with Flared Right-Of-Way

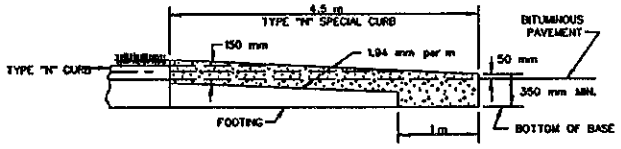


DETAILS FOR PAVED SHOULDERS

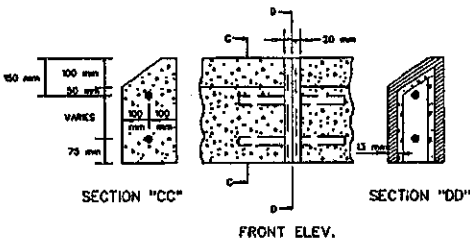
DETAILS FOR UNPAVED SHOULDERS

M WIDTH OF MEDIAN (METERS)	DIMENSIONS IN METERS WHEN R1 = 29 m		R1 = 46 m		R1 = 70 m	
	L	B	L	B	L	B
6 m	18	20	20	24	22	28
9 m	15	21	18	25	20	31
12 m	12	22	16	28	18	34
15 m			14	29	16	35
18 m					14	36
22 m					13	39

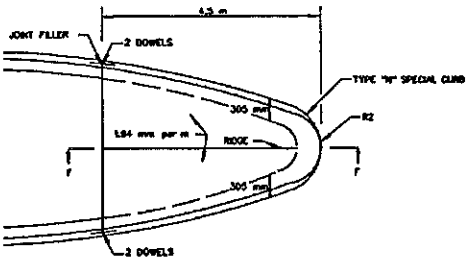
R2 = 1/2 MEDIAN WIDTH MAX. BUT IT IS PLEASING IN PROPORTION AND APPEARANCE WHEN IT IS ABOUT 1/5 OF THE MEDIAN WIDTH.



SECTION "FF"



DETAIL OF EXPANSION JOINT



TOP VIEW OF GORE PAVING

FIGURE 4-8 Median Crossover Detail

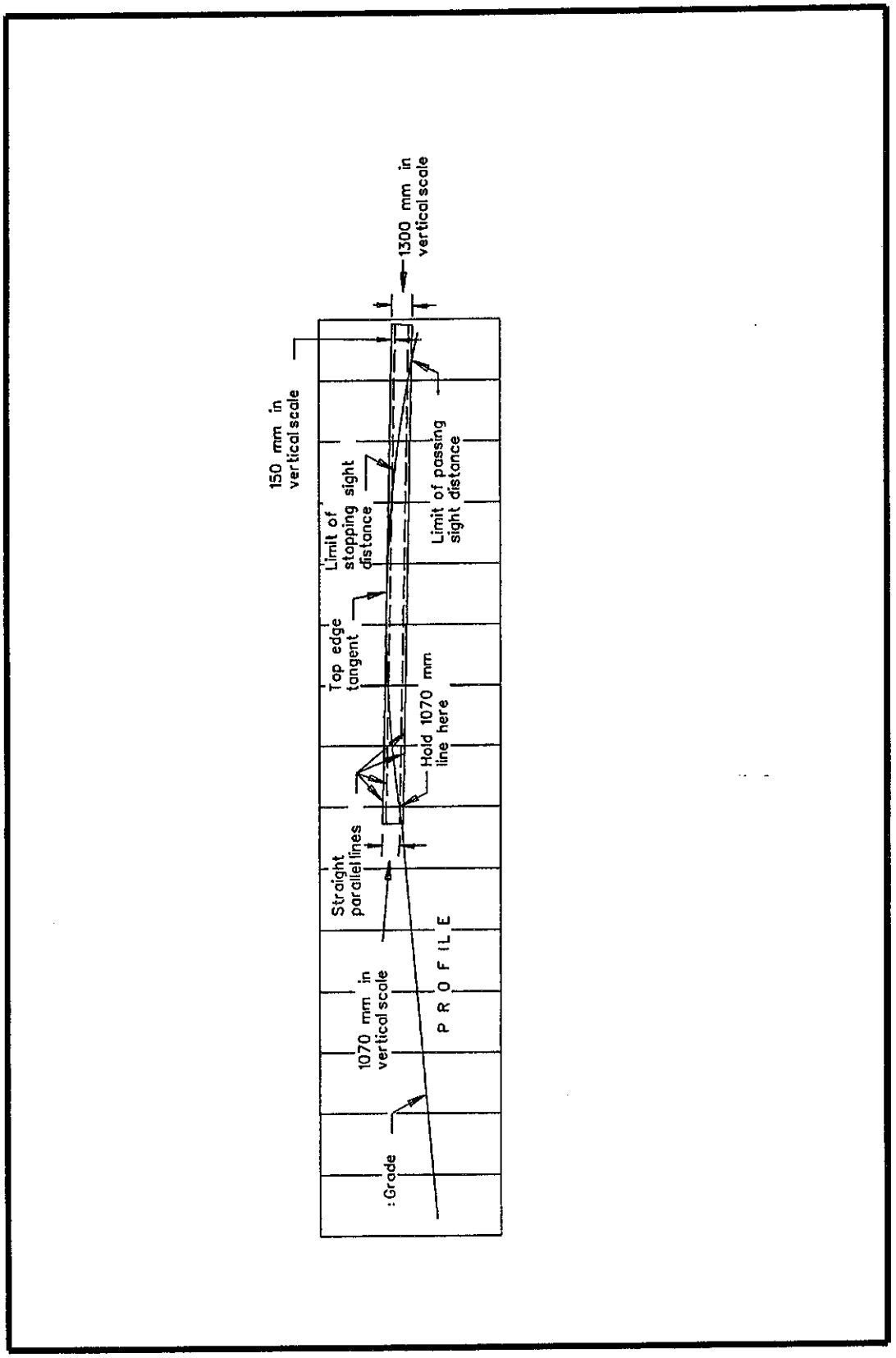


FIGURE 4-9 Scaling and Recording Sight Distances from Profiles

Design Length Of Speed Change Lanes With 2% Or Less Grade			
Posted Speed Of Roadway (km/h)	Length Of Taper (meters)	Length Of Deceleration Lane (meters)	Total Length Of Speed Change Lane (meters)
70	60	40	100
80	70	60	130
90	80	75	155
100	85	85	170
110	90	95	185
	Ratio Of Length On Grade To Length On Level For:		
ALL	3 to 4% Upgrade 0.90 - Downgrade 1.20		
ALL	5 to 6% Upgrade 0.80 - Downgrade 1.35		

TABLE 4-1 **Design Lengths of Left and Right Speed Change Lanes**

POSTED SPEED (km/h)	ASSUMED SPEED FOR CONDITION (km/h)	BRAKE REACTION TIME (sec)	BRAKE REACTION DISTANCE (m)	COEFFICIENT OF FRICTION (f)	BRAKING DISTANCE ON LEVEL GROUND (m)	STOPPING SIGHT DISTANCE REQUIRED (m)
30	30 - 40	2.5	20.8 - 20.8	0.40	8.8 - 8.8	29.6 - 29.6
40	40 - 40	2.5	27.8 - 27.8	0.38	16.6 - 16.6	44.4 - 44.4
50	47 - 50	2.5	32.6 - 34.7	0.35	24.8 - 28.1	57.4 - 62.8
60	55 - 60	2.5	38.2 - 41.7	0.33	36.1 - 42.9	74.3 - 84.6
70	63 - 70	2.5	43.7 - 48.6	0.31	50.4 - 62.2	94.1 - 110.8
80	70 - 80	2.5	48.6 - 55.5	0.30	64.2 - 83.9	112.8 - 139.4
90	77 - 90	2.5	53.5 - 62.5	0.30	77.7 - 106.2	131.2 - 168.7
100	85 - 100	2.5	59.0 - 69.4	0.29	98.0 - 135.6	157.0 - 205.0
110	91 - 110	2.5	63.2 - 76.4	0.28	116.3 - 170.0	179.5 - 246.4
120	98 - 120	2.5	68.0 - 83.3	0.28	134.9 - 202.3	202.9 - 285.6

TABLE 4-2 **Stopping Sight Distance (Wet Pavements)**

POSTED SPEED (km/h)	STOPPING SIGHT DISTANCE (m) FOR DOWNGRADES (+):			ASSUMED SPEED FOR CONDITION (km/h)	STOPPING SIGHT DISTANCE (m) FOR UPGRADES (–):		
	3%	6%	9%		3%	6%	9%
30	30.4	31.2	32.2	30	29.0	28.5	28.0
40	45.7	47.5	49.5	40	43.2	42.1	41.2
50	65.5	68.6	72.6	47	55.5	53.8	52.4
60	88.9	94.2	100.8	55	71.3	68.7	66.6
70	117.5	125.8	136.3	63	89.7	85.9	82.8
80	148.8	160.5	175.5	70	107.1	102.2	98.1
90	180.6	195.4	214.4	77	124.2	118.8	113.4
100	220.8	240.6	256.9	85	147.9	140.3	133.9
110	267.0	292.9	327.1	91	168.4	159.1	151.3
120	310.1	341.0	381.7	98	190.0	179.2	170.2

TABLE 4-3 Effect of Grade on Stopping Sight Distance - Wet Conditions

Chapter Five

MAINTENANCE MANAGEMENT SYSTEM

5.1. PURPOSE

The Alabama Maintenance Management System (MMS) provides an orderly approach for planning, scheduling and controlling maintenance work.

Management objectives and policies have been formalized by the Department's Policy Statement as shown in Figure 5-1. These objectives set forth official criteria for:

+ Maintenance Standards
+ Annual Maintenance Programs
+ Budgeting and Resource Allocation
+ Work Authorization, Scheduling and Control

Additionally, the Policy Statement authorizes the Maintenance Engineer to prepare and implement operating procedures needed to effect the Maintenance Management System. The Bureau of Maintenance has published two volumes of detailed instructions and procedures:

+ Field Operations Manual
+ Management System Procedures

The most significant elements of the MMS are briefly summarized in this chapter.

5.2. MAINTENANCE STANDARDS

Maintenance standards describe the work to be performed, an effective method for performing, and the estimated quantity of each kind of work to be completed.

5.2.1. WORK ACTIVITY DEFINITION

Each significant maintenance work activity is defined to identify the inventory item on which work is to be performed, the purpose of the work, and the general work procedures.

Work measurement units are established for each defined maintenance work activity to permit planning of the anticipated annual maintenance workload in measurable terms and to permit comparison of actual work completed with planned quantities of work.

The definition for each maintenance work activity is in the Field Operations Manual.

5.2.2. PERFORMANCE STANDARDS

ALDOT'S Maintenance Performance Standards identify two major items for each maintenance work activity:

1. an effective method of performing the work,
2. criteria setting forth the items on which work is to be performed and the degree of workmanship to be attained (quality or level of service standards).

Criteria for quality or level of service standards are contained in Chapter Six of this manual.

Each Performance Standard describes a suggested effective method of performing the work by setting forth:

1. crew size;
2. the kinds and numbers of equipment suited for the work;
3. the major types of materials to be used;
4. suggested procedures for performing the work in order to attain the desired level of service;
5. an estimate of expected average daily accomplishment using the standard crew size, equipment and procedures;
6. authorization and scheduling criteria.

An example of an ALDOT Maintenance Performance Standard is shown in the Field Operations Manual.

All of ALDOT's Maintenance Performance Standards are in the Field Operations Manual in the section entitled Performance Standards.

5.2.3. QUANTITY STANDARDS

Quantity standards are established to provide a realistic and consistent basis for estimating the measured quantity for each type of work in the annual work programs.

In effect, quantity standards establish the levels of maintenance service for planning the budget and the workload. This is discussed in Chapter Six.

5.3. ANNUAL MAINTENANCE PROGRAMS

The purpose of the annual maintenance program is to define and calculate the kinds and amount of maintenance work which are estimated to be required to provide the desired level of maintenance service in a consistent and uniform method throughout the State.

Development of the annual maintenance program involves compiling an up-to-date inventory of roadway and bridge features; using maintenance standards and the inventory to compute the maintenance workload; and identifying specific minor improvements, resurfacing and other maintenance work.

5.3.1. ROADWAY AND BRIDGE FEATURE INVENTORY

The roadway inventory to be maintained and the characteristics of the roads in terms of those features which influence maintenance requirements are identified for each district.

All roadway, roadside, and structure inventory data are updated frequently to include changes occurring during the year.

Complete instruction for conducting and updating the roadway and bridge inventory are presented in the Management System Procedures and in documentation for databases such as the maintenance feature inventory, the maintenance section log, and the Alabama Bridge Management Information System (ABIMS).

5.3.2. ROUTINE MAINTENANCE PROGRAM COMPUTATION

Computation of routine maintenance programs is a simple arithmetic procedure involving the work activity definitions, quantity standards, performance standards and the roadway inventory. Example computations are illustrated in Figure 5-2.

By treating all of the maintenance activities in this manner, the amount of work for each activity, the number of crew days allocated to that effort and the total employee days required are defined. These computations are performed for each district and road class. State-wide and division total maintenance workload needs are obtained by summarizing the district totals.

These computations are performed by the Maintenance Management Section of the Bureau of Maintenance through utilization of electronic data processing programs.

5.3.3. MINOR MAINTENANCE IMPROVEMENTS

In addition to the routine maintenance work activities that are performed throughout the year, certain work performed by maintenance personnel is classified as "Minor Maintenance Improvements." These activities improve the roadway facility and are not repeated on the same roadway section every year. Roadway widening, installing new minor drainage structures, paving shoulders and other types of improvements are included in this type of work.

These improvements are individual projects which must be planned and estimated in terms of resource requirements, and scheduled by time periods. The amount of minor maintenance improvement work that can be planned depends on total funds available and the amount of routine maintenance needs. As routine maintenance is controlled, more and more improvement work can be performed.

5.3.4. RESURFACING PROGRAM

The Bureau of Maintenance determines the total amount to be expended on the Resurfacing Program and allocates the resources to individual field divisions based on the percentage of lane miles of non-interstate bituminous pavement in each division.

5.3.5. OTHER MAINTENANCE WORK

In addition to routine maintenance work, minor maintenance improvements and the Resurfacing Program, personnel of the Maintenance Bureau also perform other work that is not related directly to maintenance of the state highways or roads designated as the responsibility of the Department. These include work for other governmental agencies, both State and local.

All work performed for counties, cities, or other governmental agencies, must be authorized and funded through a Special Work Authorization Project. Although the funds for these projects are not included in the ALDOT's Maintenance Budget, labor and equipment requirements for these projects must be estimated and included in the total resource requirements.

5.4. BUDGETING AND ALLOCATING RESOURCES

The completed maintenance workload programs serve as the basis for preparing budgets, for allocating funds among field divisions and for defining the labor and equipment needs of each division and district.

5.4.1. RESOURCE REQUIREMENTS

The work program computations identify the labor requirements by district, division and state-wide. Equipment and material needs are calculated through utilization of the performance standards and the defined work program. For example, the performance standard for spot premix patching may stipulate these conditions:

Crew Size:	5 employees
Equipment:	1 dump truck
	1 flat truck
Accomplishment/Crew Day:	5.0 metric tons premix

If the work program called for 1000 metric tons of premix patching, the resource requirements would be:

Crew days	=	1000 metric tons 5 metric tons/day = 200 crew days
Employee Days	=	5 employees x 200 days = 1000 employee days
Equipment	=	200 days x 1 dump truck = 200 days of dump truck
		200 days x 1 flat truck = 200 days of flat truck

Materials = 1000 metric tons of bituminous premix material

The above process is applied to each activity in the work program. Labor, equipment and material needs are then summarized to provide the total requirements for the year.

The resource requirements thus represent the physical resource commitment that must be made in order to fulfill the work program for a district and division. The determination of these requirements will allow the ALDOT to make rational decisions on the staffing, the renting or purchasing of equipment and the purchasing of needed materials.

5.4.2. BUDGET PREPARATION

Resource requirements are determined from the annual workload and computation of required labor, equipment and materials. These needs are identified by district, division and the entire State.

Since certain work activities will be assigned to division-wide or state-wide crews, resource requirements will be identified separately for these crews. Allocation of labor, equipment and materials is made to the divisions and districts by the Bureau of Maintenance. Allocations are determined by identified resource requirements.

The budget is prepared by applying the average unit cost data to the defined work program - average cost per hour for labor, average cost per hour for each major type of equipment, and average cost per unit of material.

Requirements for minor maintenance improvements, resurfacing, maintenance contracts and other maintenance work is estimated and included in the budget.

Thus, funds required for each maintenance operation are identified. The funds for the entire program are summarized in terms of labor, equipment, materials and contractual services. Funds allocated to each division and district are expressed in terms of estimated needs based on the feature inventory, performance standards, quantity standards, and cost of resources.

5.5. AUTHORIZING AND SCHEDULING WORK

The approved annual maintenance budget and work program authorizes the divisions and districts to perform certain amounts of identified maintenance work. The Bureau of Maintenance transmits the approved maintenance program to each division prior to the beginning of the fiscal year. On rare occasions, the transmittals may be delayed pending administrative approval.

The Division Maintenance Engineer, District Engineer and Highway Superintendent should schedule and perform the authorized work according to uniform procedures so that the maintenance program objectives are achieved effectively and economically.

5.5.1. CREW DAY CARD

Authorization to perform the planned annual maintenance work program is accomplished through the issuance of authorized work orders, or "Crew Day Cards." The crew day card, shown in the Field Operations Manual, represents one day of work for a particular maintenance work activity by a standard size crew. The annual maintenance work program identifies the total number of crew days, and therefore the number of crew day cards required to perform the planned maintenance work for a division or district. The Bureau of Maintenance authorizes the performance of the planned maintenance program when it issues the required crew day cards to the division and districts. Total crew day cards are issued by the Bureau of Maintenance prior to the beginning of each fiscal year.

5.5.2. WORK CONTROL CATEGORIES

Control of the amount of work performed is very important. But criteria for control is not the same for all work activities. The quantity of some work should be rigidly controlled. For other activities there are varying degrees of flexibility in controlling work quantities.

All maintenance activities have been grouped into four work control categories and the crew day cards for each work control category are identified by different colors. The categories and colors are:

ROUTINE UNLIMITED---------- Green
ROUTINE LIMITED---------- Red
SPECIAL AUTHORITY---------- Yellow
OVERHEAD---------- Orange

By assigning each maintenance work activity to a work control category, a general group priority is given to all routine maintenance activities. Color coding the crew day cards is only a means of identifying the different work control categories. Maintenance supervisory personnel will find these groups beneficial when scheduling and controlling routine maintenance operations at the field level. The work control category for each maintenance work activity is shown in the Field Operations Manual. Each category is briefly described in the following sections.

5.5.2.1. Routine Unlimited Category

These activities are performed when needed and in the amounts required to minimize deficiencies. There are no quantity limitations for these activities since they are to be performed as required to maintain the highways in a satisfactory condition.

The work quantity is an estimate of average conditions. In any particular year, the crew day cards needed may be somewhat more or less than indicated. The maintenance management system recognizes this condition and provides for crew day card overruns or underruns by adjustments to other activities.

Some activities included in the UNLIMITED category are Spot Premix Patching, Snow and Ice Control, and Emergency Maintenance.

5.5.2.2. Routine Limited Category

This category includes routine maintenance activities for which quantities of work can be established and reasonably adhered to. For example, mowing can be set at four times yearly, cleaning bridges twice a year and so on. For these activities, control of work quantities normally will be exercised on the basis of planned work units and the number of crew day cards issued.

5.5.2.3. Special Authority Category

These work activities do not represent a critical need. The planned work is desirable, but it is not critical if all of the planned work is not completed during the year. The quantity represents an average value designed to provide a desirable level of service. Activities such as Shovel Ditching and Brush and Tree Cutting are in this category.

Also included in this category are special maintenance activities that require approval from the Division Maintenance Engineer. Some activities included are Major Repairs of Bridges and Minor Maintenance Improvements. These types of activities need to be coordinated with the total highway improvement program.

This group of activities provides flexibility - the amount of work may be expanded or reduced during the year to meet the variations experienced by other routine activities, particularly the routine UNLIMITED category.

The use of the crew day cards for these special maintenance activities are controlled at the division level and are authorized to be used by the District Engineers at the discretion of the Division Maintenance Engineer.

5.5.2.4. Overhead Category

Included in this category are those service and overhead activities such as Structure Attendant, Weigh Station Operations, Standby Time, Training, and Materials Handling. This is necessary work but not related to routine maintenance of roadway features. Crew day cards are used principally to record work, rather than control work quantities.

5.5.3. AUTHORIZED OVERRUNS

It may be necessary to do more or less maintenance work than planned for certain work activities. This may be due to major emergencies that were not anticipated and other uncontrollable maintenance requirements. Therefore, provision is made for authorizing additional maintenance work under certain conditions. "Overrun Cards" may be issued for additional and unplanned work that is necessary.

The annual maintenance workload is designed to utilize all available labor. When overrun cards are issued, a corresponding amount of planned maintenance work should be omitted.

Criteria and instructions governing the use of overrun cards are set forth in the Field Operations Manual.

5.5.4. RESURFACING PROGRAM

An annual resurfacing program is to be developed by each Division Engineer identifying specific resurfacing projects. These projects are in addition to the routine maintenance work activities.

Detailed plans are to be prepared by the division for projects to be performed by contract. The Division should submit the plans, estimate, PMS (or CPMS) forms, and F-7A to the Maintenance Bureau for further handling.

Each division resurfacing program will be reviewed and recommended by the State Maintenance Engineer to and for approval by the Transportation Director.

Work authorized under the resurfacing or other designated programs will have a specific project number assigned prior to work authorization. Work performed by field maintenance personnel under specific project numbers should be recorded and reported on the Special Project Crew Day Card as explained in the section of the Field Operations Manual labeled "Work Reporting."

5.5.5. MINOR MAINTENANCE IMPROVEMENTS

Provision has been made in the annual work program for performance of other required minor maintenance improvement work not included in the routine maintenance or resurfacing programs. The need for maintenance improvements should be identified through formal inspections by the Division Maintenance Engineer and the District Engineer. The Highway Superintendent should advise the District Engineer throughout the year of needed improvement work in the district.

The Field Operations Manual contains a "Maintenance Improvement List" and instructions for its use by the Division Maintenance Engineer and District Engineer.

Minor maintenance improvement work from the Maintenance Improvement List may be authorized throughout the year by the Division Maintenance Engineer during scheduling meetings with the District Engineers as labor and other resources become available. The amount of minor maintenance improvement work authorized may be expanded or reduced from year to year to meet variations experienced in routine maintenance activities.

5.5.6. WORK SCHEDULING

Effective utilization of the available maintenance personnel require a uniform workload throughout the year. Some work is performed only during certain months of the year, some work is seasonal and some types of work can be performed at almost any time. These seasonal variations in work, and the different choices of work at certain times, can make a big difference in distributing the workload throughout the year to obtain the best use of labor.

To assist in balancing the labor requirements, a Maintenance Program Work Calendar is prepared for each district. The calendar lists for each maintenance work activity the number of crew days of work that normally should be scheduled and performed each month. In addition, the "planned month" for each work activity is preprinted on the crew day card. Whenever additional maintenance work is authorized and "overrun cards" are issued, a corresponding amount of planned maintenance work is eliminated from the work calendar.

5.5.7. SCHEDULING RESPONSIBILITY

General office, division, and district maintenance personnel each have certain responsibilities for scheduling maintenance work. Detailed descriptions of responsibilities are included in the Field Operations Manual.

These responsibilities are summarized as follows:

1. Bureau of Maintenance

   Prepares Maintenance Program Work Calendar, prepares and issues Crew Day Cards, and furnishes scheduling forms to each division.

2. Division Maintenance Engineer

   Issues Crew Day Cards to each district and to superintendents for division-wide crews, and authorizes specific maintenance improvement work.

3. Superintendent for Division-wide Crews

   Arranges for required labor and equipment, and issues Crew Day Cards authorized by Division Maintenance Engineer.

4. District Engineer

Arranges for required labor and equipment, coordinates daily work scheduled with District Highway Superintendent, and issues minor maintenance improvement cards to working crews.

5. District Highway Superintendent

Inspects roads, compiles a listing of maintenance needed, coordinates daily work schedules with District Engineer, pre-determines inclement weather work, selects Crew Day Cards for working crews on a daily basis, and makes crew and equipment assignments.

5.6. REPORTING AND EVALUATING PERFORMANCE

Two types of maintenance reporting and performance evaluation are required by the Alabama Department of Transportation.

5.6.1. FINANCIAL REPORTING

Financial reporting includes the accounting for all financial transactions such as payrolls, purchases, contractual services, etc., and the development of cost data as needed for planning and budget control.

The Bureau of Accounts and Finance of the Transportation Department has a comprehensive financial accounting and reporting system that provides adequate fiscal control over operations. Financial reporting procedures and forms are contained in the Standard Policies, Procedures, and Instructions Manuals.

5.6.2. WORK REPORTING

The Bureau of Maintenance requires data relative to the amount and type of maintenance performed by maintenance field personnel. These data are defined as "Work Reporting" and are used by personnel of the Management and Training Section to evaluate the effectiveness of the MMS. Work reporting provides the Bureau of Maintenance with data required to compare actual work performed with work planned and to evaluate the standards of performance and service levels attained.

Maintenance field operational data are reported through the following major reports and documents:

+ Crew Day Card
+ Special Project Crew Day Card
+ Daily Overhead and Summary Card

These documents are reviewed and entered into the database at the district and division offices. Both the Maintenance Management Section and the Computer Services Division are responsible for processing and reviewing the resulting data and reports.

The Maintenance Activity Summary, shown in the Field Operations Manual, is used as a monthly reporting and evaluation document by the District Engineer and Division Maintenance Engineer. Copies of this report also are transmitted to the Bureau of Maintenance. The total amount of work performed during the month is recorded for each maintenance work activity, as well as the number of standard and non-standard crew day cards used.

Detailed procedures and instructions for completing these reporting forms are contained in the "Work Reporting" section of the Field Operations Manual.

5.6.3. MONTHLY EVALUATIONS

Division and district maintenance supervisors and administrators should continually evaluate their work progress and performance in relation to the planned workload.

The Crew Day Cards should be reviewed to determine if standard crew sizes and equipment complements have been used. The "planned month" preprinted on the card should correspond to the month that the card is used. This is particularly critical if a balanced workload is to be obtained during the year.

Maintenance Activity Summaries provide a basis for the monthly evaluation of the amount of work performed to date, as compared to the amount planned to date for each maintenance work activity. This report identifies work activities that are either ahead of schedule or behind schedule at monthly intervals so that corrective action can be taken to remain within the total planned work program.

Field inspections and evaluations performed on a regular basis by the District Engineer and Superintendent help insure that the roadway and bridge elements are being maintained to adequate levels of service.

5.6.4. QUARTERLY EVALUATIONS

Quarterly evaluation reports compare actual work performance by division and district with the planned maintenance program and the performance standards. These reports permit division and district maintenance supervisors to identify those areas where corrective action and adjustments may be necessary in field maintenance operations.

The Field Operations Manual illustrates the types of quarterly evaluation reports that are prepared and submitted to the divisions and districts, as well as the Bureau of Maintenance in Montgomery.

5.6.5. ANNUAL QUANTITY STANDARD EVALUATIONS

The annual quantity standard evaluation report is used primarily by the Maintenance Management Section of the Bureau of Maintenance. This report permits evaluation of current quantity standards. Quantity standards are evaluated from the third quarterly evaluation reports of the fiscal year. These reports are the basis for making realistic adjustments of performance and quantity standards prior to development of the next annual maintenance work program.

DEPARTMENT OF TRANSPORTATION - BUREAU OF MAINTENANCE

SUBJECT: MAINTENANCE PROGRAM OBJECTIVES AND POLICIES

PURPOSE:

The Purpose of this Policy Statement is to define the responsibilities, objectives, and policies of the Alabama Department of Transportation (ALDOT) with regard to maintenance of highways and bridges.

DEPARTMENT RESPONSIBILITIES:

The ALDOT is responsible for maintaining all highways and bridges on the state highway system and on any state agricultural experiment station. The ALDOT may maintain the roads, streets, drives and parking areas at state institutions of higher learning, state hospitals, the Partlow School and Hospital, the Alabama Agricultural Center in the City of Montgomery, state parks, and other roads so designated by the State Legislature.

The Bureau of Maintenance of the ALDOT is responsible for developing, directing, and controlling maintenance programs in ways consistent with this Policy Statement.

MAINTENANCE OBJECTIVES:

The basic maintenance considerations and objectives of the Department are:

1. To preserve the investment made in existing highway facilities.
2. To provide continuing adequate levels of safety and convenience to the highway users.
3. To upgrade and improve existing facilities as may be economically practical through minor maintenance betterment work.
4. To conserve and protect the aesthetic and ecological features of the environment.

Figure 5-1 Statement of Maintenance Program Objectives and Policies

5. To ensure effective and economical utilization of resources in the accomplishment of maintenance programs.

These objectives will be accomplished through the effective management of maintenance operations and resources.

MAINTENANCE POLICIES:

The following basic maintenance policies are necessary for effective maintenance management:

NUMBER 1 - MAINTENANCE STANDARDS

Maintenance standards are established to serve as guides for the planning, scheduling, and performance of maintenance operations. The standards accomplish the following:

1. define levels of maintenance service to be provided and criteria for the scheduling of specific work;
2. estimate work requirements in terms of practical and significant quantitative measurements;
3. define staffing and equipment complements, materials, work methods, and procedures generally used for performing specific work in the most effective and economical manner.

NUMBER 2 - ANNUAL MAINTENANCE PROGRAMS

Annual maintenance programs shall be developed by the Maintenance Engineer clearly setting forth the types and amounts of maintenance work anticipated for the following fiscal year. Separate programs will be prepared for each division and district based on established maintenance standards and current roadway inventory data.

Annual programs shall identify the manpower, equipment, and materials required to accomplish the proposed maintenance work. To the extent that manpower and other resources are available, programs of specific minor betterment work shall be prepared.

Figure 5-1 Statement of Maintenance Program Objectives and Policies (Cont.)

Annual maintenance programs shall be reviewed and approved by the Transportation Director.

NUMBER 3 - BUDGETING AND RESOURCE ALLOCATION

Annual maintenance budgets shall be prepared on the basis of approved annual maintenance work programs. Budgeted funds shall be allocated accordingly to each division in terms of the program requirements for labor, equipment, materials, and contractual service.

Budgetary allotments shall define specific funds for:

1. routine maintenance (including emergency work),
2. maintenance resurfacing,
3. minor maintenance betterments.

NUMBER 4 - WORK AUTHORIZATION, SCHEDULING, AND CONTROL

Systems have been established for formal authorization and scheduling of work to be performed by field operations units, and for formal reporting and control measures to assure accomplishment of the work program objectives.

NUMBER 5 - OPERATING PROCEDURES

The Maintenance Engineer shall prepare and implement operating procedures as may be needed to effect a maintenance management system consistent with the criteria set forth in this Policy Statement.

The Department Auditor shall also prepare and implement operating procedures required to effect maintenance performance budgeting practices for budgeting and accounting purposes.

APPROVED BY:_____

Transportation Director Date

Figure 5-1 Statement of Maintenance Program Objectives and Policies (Cont.)

Roadway Activity	Quantity Inventory	Work Standard	Daily Units	Crew Production	Crew Days	Man Size	Days

Spot Premix Patching	1667 bituminous lane kilometers	X	0.3 metric tons premix per bituminous lane kilometer	=	500 metric tons premix	/	5 metric tons	=	100	X	5	= 500
Mowing	1010 mowable hectares	X	4 mowings per mowable hectare	=	4040 hectares	/	16 hectares	=	253	X	3	= 756
Spot Patch Unpaved Shoulders	640 unpaved shoulder kilometer	X	2.5 cubic meters material per unpaved shoulder kilometer	=	1600 cubic meters	/	60 cubic meters	=	27	X	8	= 216
Joint Filling	960 PCC lane kilometers	X	30 liters sealant per lane kilometer	=	28,80 liters	/	470 liters	=	61	X	9	= 549

Figure 5-2 **Annual Work Program Computations**

Chapter Six

MAINTENANCE SERVICE LEVELS

6.1. INTRODUCTION

The Bureau of Maintenance is responsible for developing a maintenance program for maintaining all elements of the designated highway, road and street systems in a satisfactory manner for efficient transportation for the motorist and protecting the Department's investment in these facilities.

Work activities performed by maintenance personnel have been identified and Performance Standards established that specify work methods and procedures for these work activities. The Field Operations Manual contains the detailed Performance Standard for various maintenance work activities. The resulting overall level of highway service depends on how these individual work activities are scheduled and performed on a day-to-day basis.

The objective is to be able to identify conditions that should be corrected and schedule work on a priority basis. In this chapter, three different methods are used to define desirable service levels:

1. Some conditions can readily be identified - i.e., potholes, pavement edge drop-off, height of grass.

2. Desirable service levels for some conditions can be described in terms of frequency of work performance - i.e., litter pickup, inspecting and cleaning culverts.

3. For some conditions it is not practical to describe desirable conditions. Levels of service are expressed in annual quantities of maintenance work estimated to be needed for satisfactory service.

Service levels described by either of the first two methods are straight forward and uniformly understood. Service levels defined by the third method are not readily visualized - but

consistent satisfactory results can be attained if the annual quantity standards (based on experience) are adhered to.

The following sections identify the desired service levels for each category of maintenance operations and what maintenance work activity should be performed to attain this service level.

6.2. ROADWAY AND SHOULDERS

The roadway and shoulder surfaces are important items of maintenance because they may directly affect the safety and convenience of the motorist, as well as protect a major portion of the investment of the facility. Roadway surfaces are normally paved with an asphaltic material or portland cement concrete, although gravel and other granular material may be used to provide an all-weather surface.

Paved shoulder surfaces are usually of an asphaltic material, while unpaved shoulders may be either aggregate, soil aggregate, other granular material or sod. Most unpaved shoulders consist of sod, or grass, that has been established on the earth or unpaved shoulder.

6.2.1. SERVICE LEVELS

Roadway shoulder surfaces should be maintained to provide a reasonably safe recovery zone for motorists leaving the travelway and emergency stops. Maintenance should be performed as deemed necessary by the Engineer. Minor surface defects should be scheduled for correction as work schedule permits in order to delay further deterioration of the surface. Figures 6-1, 6-2 and 6-3 illustrate roadway and shoulder conditions that may require the scheduling of maintenance work activities.

6.2.2. WORK ACTIVITIES

The types of required maintenance are directly related to the surface type and are basically the same for either the roadway surface or the shoulders. The following roadway and shoulder maintenance work activities should be performed in order to provide the desired level of service.

Activity No.	Activity Name

601 Spot Premix Patching (Hand Operation)

Minor patching small areas of paved roadway or paved shoulder with hot or cold premix bituminous material using hand tools to minimize depressions, pot holes, edge failures, upheavals and other potential surface deficiencies.

602 Major Premix Patching (Machine Operation)

Major patching of distortions, rutting and surface irregularities with premixed bituminous material to minimize rutting, grade depressions, including depressions at bridge ends, settlements and other surface irregularities and to restore a reasonably smooth surface for riding comfort. Includes replacing concrete surface with bituminous material.

603 Skin Patching

Patching small sections or isolated areas of bituminous roadway or paved shoulder surface using hand tools, hot pot or distributor to apply hot liquid asphalt and aggregate. This application minimizes extensive cracking, raveling, spalling and shallow surface failures and delays further deterioration of the surface.

604 Strip Patching

Patching continuous sections of bituminous roadway or paved shoulder surface using spreaders and distributor to apply hot liquid asphalt and stone aggregate. This application minimizes cracking, raveling, spalling and shallow surface failures and delays further deterioration of the surface.

605 Crack Sealing Concrete Pavement

(Asphalt, Rubberized Polymeric Sealer or Other Approved Material)

Cleaning and sealing random cracks in concrete pavement, including edge crack between concrete pavement and asphalt pavement or asphalt shoulder. Also included are any nonfunctional joints or cracks. (See Activity 611 and 612 for Sealing contraction and expansion joints).

606 Crack Sealing Asphalt Pavement

(Asphalt, Rubberized Polymeric Sealer or Other Approved Material) Sealing random cracks in asphalt pavement.

607 Pavement Planing

Major and minor planing of asphalt surfaces with any size pavement planer. Surface irregularities include rutting, shoving, bumps, upheavals, and other potential surface deficiencies. These irregularities may occur on open section of the roadway, at intersections, at bridge ends, at rail crossings, or on bituminous over PCC pavement.

Note: This Activity does not include any surfacing materials or work.

608 Blading Unpaved Shoulders

Blading and reshaping unpaved shoulders on paved roads without adding material or widening to minimize edge ruts, ridges, corrugations and high shoulders.

609 Patching Unpaved Shoulders

Patching unpaved shoulders by adding material, reshaping and compacting to minimize edge ruts, potholes, corrugations and to replace lost material at washouts, and around mailboxes and driveways.

610 Clipping Unpaved Shoulders

Major clipping, grading and restoration of unpaved shoulders to minimize high shoulders and to restore shoulder slope for adequate drainage.

611 Cleaning Concrete Joints

Cleaning designed joints in concrete pavement. Includes re-sawing and cleaning expansion and contraction joints with concrete saw and appropriate equipment.
Note: This work to be done before Activity 612.

612 Joint Sealing (Silicone Sealer)

Sealing designed joints (expansion and contraction) in concrete pavement. Includes longitudinal and transverse joints. Does not include Sealing Crack between concrete pavement and asphalt pavement or asphalt shoulder. (See Activity 605 for sealing edge crack.)
Note: This work to be performed after Activity 611.

613 Concrete Pavement Repair

Correcting and repairing broken slabs, edge failures, spalls, corner breaks, and severe cracking in concrete pavement. Includes all major work such as removing part or all of a slab or section, pressure grouting, pressure jacking, joint repair, and repair or replacement of base and subbase.
Note: This Activity includes all concrete pavement repair not covered in Activities 605, 611 and 612.

614 Other Roadway and Shoulder Maintenance

Other work activities performed on the roadway or shoulder but not specifically listed as a separate activity, such as:

+ dust control,
+ dusting bleeding bituminous surface,
+ sweeping and washing,
+ epoxy patching,
+ mudjacking,
+ base repair,
+ spot patching unpaved roads,
+ cleaning of curb and gutters,
+ hand patching unpaved shoulders,
+ trimming sod buildup back from edge of paved shoulders,
+ bituminous edge patching of unpaved shoulders,

+ minor planing, such as using "Lee Boy" planer.

6.3. DRAINAGE

The maintenance of drainage structures is important because the base and subgrade should be properly drained or the surface will deteriorate. Drainage facilities include ditches along the roadway, both paved and unpaved, pipes and box culverts, catch basins, inlets, flumes, curb and gutter, outfall ditches and other minor structures designed to channel the flow of water away from the roadway.

6.3.1. SERVICE LEVELS

Unpaved ditches should be maintained at a functional level.

Paved ditches should be periodically cleaned of debris and all paving materials kept in place. Flumes, inlets, curb and gutter sections and other minor drainage structures should be cleaned and repaired whenever necessary due to damage or deterioration.

All box culverts and pipes, should be inspected periodically. All debris, silt, undesirable vegetation and other obstructions should be removed from the culvert and its openings to insure proper flow of water. Structural damage and deterioration should be scheduled for repair as soon as possible after inspection. Drainage facilities that do not function properly should be reported to the Division Maintenance Engineer so that an improvement or replacement can be scheduled.

Figures 6-4 and 6-5 show typical problem areas in drainage structures that should be corrected.

6.3.2. WORK ACTIVITIES

The maintenance effort for drainage structures involves roadside ditches, box culverts and pipe culverts. Maintenance work activities applying to drainage maintenance are as follows:

Activity No.	Activity Name

615 Patrol Ditching

Machine cleaning of roadside ditches with a motor patrol to restore grade and maintain adequate drainage. Includes loading, hauling and disposal of excess material, if necessary, and shoulder restoration as related to ditching.

616 Shovel Ditching

Machine cleaning and reshaping of roadside ditches, with an excavator or similar equipment, to restore grade and maintain adequate drainage. Includes loading, hauling, disposal of excess material and shoulder restoration as related to ditching.

617 Cleaning Minor Drainage Structures

Periodic inspection, cleaning and removal of debris as required from box culverts, pipe culverts, catch basins and inlets to maintain adequate drainage.

618 Repairing Minor Drainage Structures

Repair of box culverts and repair or replacement of pipe culverts, catch basins, inlets, flumes, curb and gutter and other minor drainage structures due to damage or deterioration. This activity does not include installation of new facilities or enlargement of existing facility.

624 Other Drainage Maintenance

Other drainage maintenance activities that are not specifically identified as separate activities. Includes activities such as:

+ paved ditch maintenance,
+ Relocation of ditches,
+ hand ditching,
+ scour and Washout repair,
+ inlet and outfall ditch maintenance, and
+ placing rip rap.

Roadside maintenance management, as much as any other part of the roadway maintenance program, contributes to the operational needs of the road user, increases the life of the roadway and roadside hardware, enhances visual quality, and promotes environmental balance. Roadside maintenance includes mowing and chemical management of turfs, landscape forestry, other vegetation control, removal of litter and debris, erosion control, re-establishment of turfed areas disturbed by other maintenance procedures, fence repair, and the maintenance of other items within the right-of-way that are not related to roadway surface or drainage structures. Normally, all items from the edge of the pavement, excluding non-turfed drainage features, to the right-of-way limits are included in roadside maintenance operations.

6.4.1. SERVICE LEVELS

In so far as possible, roadsides on any given segment of highway right-of-way should be maintained in a manner compatible with the level of development of the adjacent property. This will provide a smooth transition and help the right-of-way blend into its surroundings. This approach to service levels requires that the roadside be maintained in a safe, clean, and attractive condition. Work items requiring the most emphasis are vegetation management (including mowing, broadcast herbicide treatment, spot herbicide treatment, and landscape forestry), landscape enhancement, litter and debris pickup, erosion control, and other slope maintenance.

To aid district and division personnel in establishing service levels, the Bureau of Maintenance has established four service levels. Each level has its own special set of guidelines for roadside maintenance.

Each division engineer will determine the level of roadside maintenance for individual segments of all state maintained roads within the division based upon the statewide uniform maintenance budget. Performance standards and levels of service are determined by the Technical Advisory Committee.

6.4.1.a. Determining Service Levels

Average daily traffic (ADT) ranges and descriptions of surrounding property use from the table below should be used to determine the appropriate level of vegetation management for each segment of state-maintained roadway in the division. Maps of each district should be

developed showing the level of vegetation management for each state-maintained roadway by designated color, as described in Subsection 6.4.1.b.

RECOMMENDED METHOD OF DETERMINING SERVICE LEVELS

IF ADT IS:	AND SURROUNDING PROPERTY USE IS:	THEN LEVEL IS:	COLOR IS:
Varies	Developed urban (residential, commercial, or service	1	Red
10,000 & Above	Partially developed urban or rural	2	Blue
3,000 to 10,000	Rural (moderately maintained Interstate, U.S. and high volume state highway)	3	Yellow
0 to 3,000	Rural (low maintenance areas; low volume state highway	4	Green

6.4.1.b. Division Map

Each division maintenance engineer should color-code a standard division map to show the appropriate level of vegetation management for each section of roadway. (See preceding table for color codes.) The map should serve as a management tool and should be updated as traffic conditions, adjacent property use and other factors change. The division maintenance engineer should furnish a duplicate of the current color-coded map to the Bureau of Maintenance for review and reference.

NOTE: Sample Map is Available from the Maintenance Bureau.

6.4.1.1. Mowing

Mowing areas within the right-of-way only as required for a clean and an attractive appearance eliminates many erosion problems, reduces maintenance requirements for manpower and money, and allows natural diversity of vegetation to develop. Through the establishment of mowing standards, the Department will be able to obtain a uniformly attractive appearance of the roadsides in all areas of Alabama.

In so far as possible, roadsides on any given segment of highway right-of-way should be managed/mowed in a manner compatible with the level of development of the adjacent property.

The level of roadside mowing is determined by State Wide Uniform Maintenance Budgets, Performance Standards, and Levels of Service as may be applied by the Technical Advisory Committee. Mowing of roadsides should be in accordance with current procedures, guidelines, and/or administrative directions as contained in the current Manual for Roadside Vegetation Management.

The mowing of rest areas and welcome centers may be performed by the rest area and welcome center attendants and should be performed to maintain a clean and attractive appearance. Hand mowing and trimming should be limited to those areas that must be cut and are inaccessible to the tractor mowers.

6.4.1.2. Herbicide Treatment

The use of herbicides to manage and control vegetation along Alabama highways is a very important program. It is more effective, more economical, and requires less labor and equipment than the alternate methods of hand cutting and mowing. Herbicides are very effective in the control of brush, broadleaf, kudzu, etc. A successful herbicide program depends on the knowledge, training, and skills of personnel involved in the program.

The use of herbicides to control vegetation within highway rights-of-way should be in accordance with current procedures, guidelines, the current Manual for Roadside Vegetation Management, and administrative directives. Any deviations from current established guidelines and procedures should be approved by the Maintenance Bureau prior to beginning such work.

6.4.1.3. Erosion Control

Erosion of roadway slopes is not only unsightly but can cause damage to the roadway subgrade by allowing water to enter and weaken the base which leads to surface failures. Slides and rock falls also occur on unstable slopes that do not have proper vegetation cover. Slides and other erosion damage can block ditches and other minor drainage structures which in turn will lead to major maintenance repairs.

All slopes should be maintained in grass, shrubs, or other vegetation to prevent erosion and other slope damage. Slopes, shoulders, medians and other vegetated areas should be fertilized, seeded or reseeded and mulched as needed to maintain or restore vegetation for erosion control, beautification or delineation of mowing limits.

Trees, shrubs, or other vegetation planted on the roadside are to be based on a plan developed under the supervision of the District Engineer and approved by the Division Maintenance Engineer. The plan should be prepared in accordance with criteria and guidelines issued by the Landscape Architect and other appropriate guidelines for operation. The location and species trees, shrubs or other vegetation should blend with the surrounding environment and not encroach upon the required clear roadside area.

6.4.1.4. Litter and Debris Cleanup

Rocks, metal objects, dead animals, recap tire treads and other large objects should be removed from the roadway as soon as possible after they are observed by a maintenance crew or reported to the district office.

Roadside litter pickup of the entire right-of-way should be performed before the start of the mowing season and as needed to maintain an attractive roadside. Large rocks, stumps and other major obstructions should be removed from the roadside to permit more efficient and safer mowing operations. Urbanized areas and other isolated locations may require more frequent attention either through a spot pickup or full width litter pickup.

6.4.2. WORK ACTIVITIES

Several maintenance work activities are involved in the maintenance of roadside features. Some of these activities are major and require more time, equipment and personnel. The following activities should be performed in accordance with the designated service levels:

Activity No.	Activity Name
625	Mowing (Interstate) Mowing of roadside vegetation within the designated mowing limits of the right-of-way, using tractor mowers and hand mowing, if required, to maintain an attractive roadside capable of controlling erosion and providing drainage. This activity includes slope mowing but does not include mowing at rest areas and welcome centers or the hand mowing at roadside parks and picnic areas.
625	Mowing (Other State/Divided State) Mowing of roadside vegetation within the designated mowing limits of the right-of-way, using tractor mowers and hand mowing, if required, to maintain an attractive roadside capable of controlling erosion and providing drainage. This activity includes slope mowing but does not include the mowing at rest areas and welcome centers or the hand mowing at roadside parks and picnic areas.
626	Broadcast Herbicide Treatment Broadcast spraying of roadside vegetation within the designated mowing limits of the right-of-way using tractor or truck sprayer to control vegetation.
627	Brush and Tree Cutting Cutting and trimming brush and trees within the right-of-way using power or hand tools to improve sight distances and remove offensive encroaching vegetation. Includes hand trimming (sling-blading) or weed eating under guardrail, around bridge ends and other places where machine mowing is not possible. Approved herbicides shall be used on all cut stumps.

628 Erosion Control

Seeding, reseeding, sodding, fertilizing and mulching of shoulders, back slopes, medians and other areas to restore vegetation for erosion control and beautification.

629 Spot Litter Pickup

Cleaning isolated spots within the right-of-way, including pickup, hauling, loading and disposing of litter, debris or dead animals. This activity also includes emptying, hauling and disposing of refuse from litter barrels in roadside parks, rest areas, and scenic overlooks, as well as periodic cleanup, repair and hand mowing or trimming at roadside parks, picnic tables and scenic overlooks.

630 Full Width Litter Pickup

Full width cleaning of continuous sections of the right-of-way area including pickup, loading, hauling and disposing of accumulated litter.

631 Spot Herbicide Treatment

Application of herbicide around guardrail, signpost, delineators, mailboxes, bridge ends, etc., for vegetation control and application of herbicide for brush and weed control in ditches, under bridges and on cut and fill sections.

632 Landscape Enhancement

Installation and maintenance procedures required to fulfill landscape enhancement design or designated areas. Work conforms to current guidelines for operations. Work includes wildflower planting and preservation and other landscape related work.

634 Other Roadside Maintenance

Other roadside maintenance activities that are not specifically identified as separate activities. Includes activities such as:

+ removal of slides and other major obstructions
+ rock cut maintenance
+ spot slope repairs
+ removal of unauthorized/illegal signs within the right-of-way
+ hay baling
+ fence Repair
+ mowing slopes with boom-type or extension-arm mower only, and
+ spot mowing behind curb.

6.5. TRAFFIC OPERATIONS

Highway signs, pavement markings, delineators, traffic signals, lights, guardrails and other traffic service features are placed on, and along, highways to assist and guide the motorist.

6.5.1. SERVICE LEVELS

The maintenance and installation of all traffic service features should conform with the Manual on Uniform Traffic Control Devices.

Traffic signs, directional markers, kilometer posts, delineators and guide posts should be inspected and cleaned periodically to insure legibility and reflectivity. Inspections should be performed both during daytime and nighttime hours. Sign Posts and other traffic supports should be maintained in an upright and straight position. Signs and other markers damaged beyond effective use should be replaced with new or restored signs. Stop signs and other regulatory signs should be repaired or replaced as soon as possible after discovery or notification.

Centerline stripes, edgeline markings and other pavement markings should be repainted as needed. More frequent repainting may be required in urban areas and heavily

traveled sections of highways. All resurfaced roads should be properly marked as part of the resurfacing project.

State maintained traffic signal controllers, flashing signals, other electrical traffic control devices and street lights should be periodically inspected, repaired, cleaned and adjusted as required to assure proper functioning and illumination. Electrical traffic control devices should be repaired or replaced as soon as possible after notification of their malfunction.

Guardrail maintenance should be performed in accordance with the original design standard or according to revised specifications. Particular attention should be given to placement of posts and location of end sections, including proper fastening and hardware.

Traffic control devices and markings for detours should be properly maintained during the period they are required. After the detour is no longer required, or the emergency no longer exists, all traffic control devices and markings should be promptly removed. Pavement markings that are not required should be removed.

6.5.2. WORK ACTIVITIES

The proper maintenance of traffic control devices and markings provide the motorist with effective guidance when traveling the highways, roads and streets throughout the State. The following specific traffic operations work activities should be performed on all roads and highways that are designated for maintenance by the Department of Transportation.

Activity No.	Activity Name
635	Sign Maintenance Routine repair, resetting, replacement of traffic signs, directional markers, kilometerposts, delineators, guide posts or hazard markers unserviceable due to accident damage, vandalism or deterioration to restore and maintain adequate control and guidance of traffic. This Activity does not include work on sign upgrading programs or installation of signs at new locations. Note: Does not include electric utility cost. See Activity 644.
636	Centerline and Edgeline Painting

Painting centerlines, edgelines, barrier lines and lane markings to restore traffic control.

637 Pavement Message Marking

Marking pavement messages, direction markers, stop bars, gore areas, crosswalks, curbs and traffic islands to provide markings for vehicular and pedestrian control.

638 Guardrail Maintenance

Repair or replacement of guardrail sections, posts and hardware unserviceable due to accident damage or normal deterioration. (Replace to latest standard if practical.) Straighten guardrail sections and posts as stockpiled.

639 Traffic Signal Maintenance

Repair and replacement of Alabama Department of Transportation maintained traffic signals, controllers, flashing signals and beacons. Includes the replacement of lamps, wiring, electric time clocks, standards and bases and the cleaning of lens and control mechanisms.

Note: Does not include electric utility cost. See Activity 644.

640 Raised Pavement Marker Maintenance

Replacement of damaged and/or missing raised pavement markers, (both reflective and non-reflective), to restore adequate pavement delineation and traffic control.

644 Other Traffic Operations

Other traffic operations activities that are not specifically identified as separate activities. Includes activities such as:

+ Dotting centerlines and edgelines,
+ Installing barrier line markers,
+ Removal of pavement markings,
+ Reflective painting on bridges,
+ Cleaning and painting traffic signals, guardrail and overhead sign supports,

+ Maintenance of detour markings and warning devices,
+ Maintenance of crash control barriers,
+ Maintenance of channelization curbs,
+ Rumble strip placement and maintenance,
+ Nighttime reflectivity inspections,
+ Maintenance of street lights, and
+ Utility cost for all lighted devices.

6.6. STRUCTURES

Structures, or bridges, serve to carry traffic along the roadway and over waterways and are more than 6.1 meters in length measured along the centerline of the roadway. Types of structures vary from bridge culverts to major concrete and steel trusses. Simple wooden structures and complex movable span structures are also found on the State Highway System and consist of structures that were built many years ago to those with the latest design features. These structures are a crucial part of the highway network and should receive proper maintenance. (See Figure 6-6.)

6.6.1 SERVICE LEVELS

An adequate program of inspection and preventive maintenance can reduce the amount of work and costs required for corrective structure maintenance.

The Department has a comprehensive state-wide bridge inspection program that includes inspection of the structural elements of every bridge on the State Highway System every two years - Work Activity No. B37 - Bridge Inspection. These inspections and ratings are performed by a state-wide or division-wide bridge inspection crew specially trained and knowledgeable of AASHTO and FHWA bridge inspection procedures and specifications. (See Figure 6-7.)

In addition to these detailed structure inspections, every structure should receive periodic routine inspection and maintenance by district or division maintenance personnel. Structural repair or routine maintenance needs observed during the routine inspection should be reported to the District Engineer and noted on Form BI-9.

Structural steel elements on bridges should be cleaned or sandblasted, primed and painted to prevent rusting and deterioration of the steel members.

Movable span structures should be serviced and maintained by a division or state-wide crew that is trained to repair and/or replace the mechanical, electrical and structural elements of movable spans.

Major and minor structural repairs should be performed during the year as required. Damage and the need for repairs will be reported through results of the state-wide bridge inspection program and routine maintenance and cleaning of structures by district or division personnel.

6.6.2. WORK ACTIVITIES

Structure maintenance involves routine maintenance activities as well as work requiring specialized crews and equipment. Structure maintenance activities are as follows:

Activity No.	Activity Name
B01	Deck/Drain/Joint Cleaning (MMS reports as 645 - Bridge Cleaning) Regular cleaning of bridge deck, drain holes, drains, expansion joints, and bridge seats. Cleaning of expansion joints is specifically included in this activity.
B02	Curb/Rail/Fence Repair (MMS reports as 647 - Minor Repair of Bridges) Maintenance, repair or replacement of all types of bridge rails, handrails, posts, post blocks, post brackets, curbs, wheelguards, sidewalks, and other elements specifically related to the curbs, walks, and rails, including fencing on top of rails.
B03	Joint Repair - Open (MMS reports as 648 - Major Repair of Bridges)

Maintenance and repair of open bridge joints, such as grouting anchors, welding additional anchors, replacing or removing angles, plates and bolts.

B04 Joint Repair - Sealed

(MMS reports as 648 - Major Repair of Bridges)
Maintenance and repair of sealed bridge joints including removal and/or replacement of sealed joint material, plates, angles, anchors, and bolts.

B05 Minor Deck Repair - Steel

(MMS reports as 647 - Minor Repair of Bridges)
Maintenance, repair or replacement of a small portion of the deck. Includes the placement/removal or repair of approved overlays. This includes the clean-up, capture, containment, and disposal of any residue.

B06 Minor Deck Repair - Concrete

(MMS reports as 647 - Minor Repair of Bridges)
Maintenance, repair or replacement of a small portion of the deck. Includes the placement/removal or repair of approved overlays. This includes the clean-up, capture, containment, and disposal of any residue.

B07 Minor Deck Repair - Timber

(MMS reports as 647 - Minor Repair of Bridges)
Maintenance, repair or replacement of a small portion of the deck. Includes the placement/removal or repair of approved overlays. This includes the clean-up, capture, containment, and disposal of any residue.

B08 Major Deck Repair - Steel

(MMS reports as 648 - Major Repair of Bridges)

Major repair or replacement of a significant portion of the deck or components such as grid deck (filled or open) and plates. Includes the clean-up, capture, containment, and disposal of any residue. Also includes placement or removal of overlay.

B09 Major Deck Repair - Concrete

(MMS reports as 648 - Major Repair of Bridges)

Major repair or replacement of a significant portion of the deck. Includes the clean-up, capture, containment, and disposal of any residue. Also includes placement or removal of overlay.

B10 Major Deck Repair - Timber

(MMS reports as 648 - Major Repair of Bridges)

Major repair or replacement of a significant portion of the deck or deck components such as runners, and transverse or diagonal flooring or sub-flooring. Includes clean-up, capture, containment, and disposal of any residue. Also includes placement or removal of overlays.

B11 Minor Superstructure Member Repair - Steel

MMS reports as 647 - Minor Repair of Bridges)

Minor repair of steel superstructure members such as welding, rivet, or bolt replacement to diaphragms, bracing, trusses, and minor repair or servicing of bearing assemblies.

B12 Minor Superstructure Member Repair - Concrete

(MMS reports as 647 - Minor Repair of Bridges)

Minor repair of concrete superstructure members such as spall repair, crack repair (epoxy injection), and minor repair or servicing of bearing assemblies.

B13 Minor Superstructure Member Repair - Timber

(MMS reports as 647 - Minor Repair of Bridges)

Minor repair of timber superstructure members such as stringers and bracing.

B14 Major Superstructure Member Repair - Steel
(MMS reports as 648 - Major Repair of Bridges)
Major repair or replacement of steel beams, girders, diaphragms, bracing, trusses, cables, and complete replacement of bearing assemblies.

B15 Major Superstructure Member Repair - Concrete
(MMS reports as 648 - Major Repair of Bridges)
Major repair or replacement of concrete girders, diaphragms, girder ends, complete bearing assemblies replacement, and backwalls.

B16 Major Superstructure Member Repair - Timber
(MMS reports as 648 - Major Repair of Bridges)
Major repair or replacement of timber stringers and bracing. Includes installation of additional stringers or beams to enhance load carrying ability.

B17 Minor Substructure Member Repair - Steel
(MMS reports as 647 - Minor Repair of Bridges)
Minor repair of steel piling, bracing, supports, caps, footings, abutments, and bents. Includes underwater repairs.

B18 Minor Substructure Member Repair - Concrete
(MMS reports as 647 - Minor Repair of Bridges)
Minor repair of concrete piling, bracing, supports, caps, footings, abutments, and bents. Includes underwater repairs.

B19 Minor Substructure Member Repair - Timber

(MMS reports as 647 - Minor Repair of Bridges)
Minor repair of timber piling, bracing, supports, caps, footings, abutments, and bents. Includes underwater repairs.

B20 Major Substructure Member Repair - Steel
(MMS reports as 648 - Major Repair of Bridges)
Major repair, replacement or addition to substructure members such as footings, caps, piers, bents, piling, and abutments. Includes underwater repairs.

B21 Major Substructure Member Repair - Concrete
(MMS reports as 648 - Major Repair of Bridges)
Major repair, replacement or addition to substructure members such as footings, caps, piers, bents, piling and abutments. Includes underwater repairs.

B22 Major Substructure Member Repair - Timber
(MMS reports as 648 - Major Repair of Bridges)
Major repair, replacement or addition to substructure members such as footings, caps, piers, pilings, bents, and abutments. Includes underwater repairs.

B23 Bridge Painting - Spot
(MMS reports as 646 - Bridge Painting)
Cleaning and painting of a small portion of the paintable portions of the structure. This includes cleaning by chemical or mechanical means, capture and containment of residue as required, the application of the paint system, and any related clean-up and disposal of residue.

B24 Bridge Painting - Partial
(MMS reports as 646 - Bridge Painting)

Cleaning and painting of a significant part of the paintable portions of the structure. This includes cleaning by chemical or mechanical means, capture, and containment of residue as required, the application of the paint system and any related clean-up and disposal of residue.

B25 Bridge Painting - Complete

(MMS reports as 646 - Bridge Painting)

Cleaning and painting of all or the majority of the paintable portions of the structure. This includes cleaning by chemical or mechanical means, capture and containment of residue as required, the application of the paint system and any related clean-up and disposal of residues.

B26 Bridge Culvert Cleaning

(MMS reports as 645 - Bridge Cleaning)

Cleaning of bridge culverts (structures exceeding 6.1 meters measured along centerline of roadway) including drainage ditches to and from the structure, removing debris and deposits from the barrels, repairing and replacing rip-rap and any related clean-up and disposal of materials.

B27 Bridge Culvert Repair

(MMS reports as 647 - Minor Repair of Bridges)

Repair of bridge culverts (structures exceeding 6.1 meters measured along centerline of roadway) including components such as top and bottom slab, cutoff walls, wing walls, aprons, and filling or grouting voids. Cleaning and repair of drainage ditches to and from the structure are not included in this activity.

B28 Light/Navigation Light Repair

(MMS reports as 654 - Other Structure Maintenance)

Maintenance or repair of illumination lights, navigation lights, electrical system and electrical appurtenances.

B29 Drift Removal

(MMS reports as 645 - Bridge Cleaning)
Maintenance or repair required to remove all debris obstructing normal channel flow from all bridge structures.

B30 Slope and Shore Protection Repair

(MMS reports as 648 - Major Repair of Bridges)
Maintenance or repair to slope and shore protection devices, dolphins and pier protection systems including concrete and stone rip-rap, timber, steel and concrete sheeting. Includes placing additional shore protection devices such as sheeting at abutments for scour protection.

B31 Accident Repair

(MMS reports as 647 - Minor Repair of Bridges)
Repair of any bridge elements damaged as a result of accidents. Includes damage from automobiles and trucks or from waterway traffic such as boats and barges.

B32 Vandalism Repair

(MMS reports as 645 - Bridge Cleaning)
Repair of any bridge elements damaged as a result of vandalism. Includes the removal of graffiti, political signs attached to the structure, unauthorized painting, lettering or markings.

B33 Moveable Span Maintenance

(MMS reports as 649 - Moveable Span Operation and Maintenance)
Repair, replace, and/or service equipment, components, and facilities of the moveable span structure. Repairs to the deck, superstructure, substructure, and painting are not included in this activity

B34 Moveable Span Operations

(MMS reports as 649 - Moveable Span Operation and Maintenance)
Overhead costs necessary to the daily and continuing normal operation of the moveable span. Maintenance, repair, and service are not included in this activity. See activity "Moveable Span Maintenance".

B35 Tunnel Maintenance
(MMS reports as 650 - Tunnel Operation and Maintenance)
Repair, replace, and/or service equipment, components, and facilities of the tunnel.

B36 Tunnel Operations
(MMS reports as 650 - Tunnel Operation and Maintenance)
Overhead costs necessary to the daily and continuing normal operation. Maintenance, repair, and service are not included in this activity. See activity "Tunnel Maintenance".

B37 Bridge Inspection
(MMS reports as 675 - Bridge Inspection)
Inspection of bridges by State or Division bridge inspection crew to evaluate the bridge in accordance with NBIS, AASHTO and FHWA inspection specifications. Also includes above water and underwater inspection done by contract or consultant.

B38 Other Structure Maintenance
(MMS reports as 654 - Other Structure Maintenance)
Other structure maintenance activities that are not specifically identified as separate activities.

B39 Other Structure Maintenance
(Not Maintenance)
Engineering and inspection on maintenance construction projects by project personnel, Maintenance Bureau personnel, or other appropriate personnel.

B40 Construction Materials Testing

(Not Maintenance)

Testing of materials on maintenance construction projects by project personnel, Bureau of Materials and Tests personnel, or other laboratory/testing personnel.

B99 Bridge Maintenance Overhead

(MMS reports as 654 - Other Structure Maintenance)

Bridge maintenance costs which are not readily identifiable to any other bridge maintenance function.

Activity No.	Activity Name
645	Bridge Cleaning Regular cleaning of major and minor bridges including hand sweeping, cleaning drain holes and bridge seats, debris removal from expansion joints and waterway openings, vegetation control, and fireproofing of timber structures and removal of writing or painting on the structure.
646	Bridge Painting Sandblasting, cleaning, priming and painting of structural elements including handrails or guardrails, to minimize deterioration. Minor painting of handrails only should be charged to Activity 654 - Other Structure Maintenance.
647	Minor Repairs of Bridges Minor repairs including repair or replacement of handrails, curb, sidewalk, timber planks, minor joint and deck repair and other minor repairs.
648	Major Repairs of Bridges Major repairs to bridge structural elements such as piling, piers or abutments. Also includes underwater repair work.
649	Movable Span Maintenance

Operation and maintenance of movable span bridges and the mechanical, electrical or structural maintenance on movable span bridges and mechanisms. Routine servicing and lubrication is to be performed periodically.

650 Tunnel Maintenance

Mechanical, electrical or structural maintenance on tunnels and related systems.

654 Other Structure Maintenance

Other structure maintenance activities that are not specifically identified as separate activities. Includes activities such as:

+ Navigation light maintenance,
+ Replacing rip-rap,
+ Repair of slope paving,
+ Expansion joint maintenance,
+ Mechanical bridge deck sweeping, and
+ Minor handrail painting.

Note: Utility costs on navigation lights are to be charged to Activity 644.

6.7. MINOR MAINTENANCE IMPROVEMENTS

In addition to regular maintenance work efforts, maintenance personnel also perform minor maintenance improvements. This work improves the element of the roadway, or structure to a level greater than the original facility.

6.7.1. SERVICE LEVEL

The amount of minor maintenance improvement that can be performed is controlled by the availability of manpower and resources, and should be performed after routine maintenance needs are met.

6.7.2 WORK ACTIVITIES

Minor maintenance improvement activities are to be classified as follows:

Activity No.	Activity Name
656	Other Roadway/Shoulder Improvements All minor improvements to the roadway or shoulder on the State Highway System to increase capacity and safety. Includes minor reconstruction, widening by adding turn lanes, climbing lanes, speed change lanes or crossovers and minor shoulder improvements.
657	Roadside Improvements All minor improvements to the roadside of the State Highway System to improve erosion control, appearance, drainage and service for the motorists. Includes flattening backslopes and fills, tree and shrubbery planting.
658	Drainage Improvements Construction of new drainage facilities on the State Highway System to increase drainage capacity and protect the roadbed. Including culverts, ditches, catch basins, berms, tile drains, ditch checks, inlets, paved ditches and flumes and drainage curbs, but not including new driveway pipes.
659	Traffic Operations Improvements All minor improvements of traffic operations on the State Highway System including the installation, at new locations, of new traffic signs, signals, street lights, traffic islands, medians, delineators, channelization curb, guardrail, fence, raised pavement markers, and new detour signs and new temporary signing not covered by a specific project.
664	Other Improvements

Any other minor improvement to the State Highway System.

6.8. WINTER AND EMERGENCY

The majority of the work performed by maintenance personnel can be planned and scheduled on a regular basis. Exceptions to this include snow and ice control and other emergency or extraordinary repairs caused by storms, floods, traffic accidents and other natural disasters.

6.8.1. SERVICE LEVELS

Minor maintenance work due to emergencies and disasters should be performed as soon as possible to protect the motorist and elements of the roadway and structures on State Highway System. Major repairs and/or replacement of damaged roadway and bridge elements are to be scheduled through the division and the Bureau of Maintenance as special maintenance projects.

The effects of snow and ice can not be predicted. Maintenance personnel should be prepared when these conditions occur. Materials should be stockpiled and equipment ready.

A high priority should be put on bridge structures which usually freeze and become slippery first. Some sections of roadway surfaces such as hills and curves may freeze and become slippery. Sand or fine abrasive material may be effective in these type conditions. During long periods of sleet and snow, repeated use of abrasive material may cause problems during thawing by holding water on a roadway which freezes again at night.

Chemicals may be effective in controlling ice forming on the surface of the road. Chemicals, if applied at the proper time, can assist in the removal of snow and ice accumulation on the roadway surface.

Bridge and culvert decks should not be treated with chemicals which are used to remove snow and ice accumulations. These chemicals usually initiate or greatly accelerate the corrosion of reinforcing steel and corrosion in the steel members of bridges and culverts. Chemicals may be used on structures to assist in the removal of snow and ice accumulations only after approval is given by both the Division Engineer and the State Maintenance Engineer.

The District Engineer and Superintendent should work closely with local law enforcement in evaluating and determining road conditions. It may be necessary to close a road if a large portion of the road is covered with ice, or if snow is freezing on hills making it difficult to travel. Whenever practical, traffic should be allowed to use the roadway since closed roads tend to freeze more quickly making it necessary to leave the road closed for long periods of time.

Any road closure should be promptly reported to the Division Maintenance Engineer.

6.8.2. WORK ACTIVITIES

Maintenance Work activities identified as winter and emergency are the following:

Activity No.	Activity Name
665	Snow and Ice Control Removing snow and ice from the roadway, application of sand, ice control on structures, and other snow and ice control activities to improve driving conditions. Do not apply chemicals to structures.
666	Emergency Maintenance Emergency or extraordinary repairs, traffic control and cleanup of roadway, roadside and structures on the State Highway System due to storms, floods, traffic accidents, civil disorders or other disasters.

6.9. SERVICE ACTIVITIES

The Bureau of Maintenance annual work program includes a number of work activities that are not related to the maintenance of specific roadway or structural elements. These activities are performed to protect highway facilities and to provide general services to the motorist and other State agencies whose facilities are designated as part of the State Highway System. Attending rest areas, welcome centers, inspecting bridges and operating movable span structures are some of the activities performed.

6.9.1. SERVICE LEVELS

The types of services to be provided in this category of work are defined by guidelines of the Alabama Department of Transportation and the Code of Alabama.

Designated rest areas and welcome centers that have rest rooms, picnic tables and other tourist facilities are to have attendants on duty on a 24-hour basis. In addition to maintaining the Rest Area or Welcome Center and its facilities, the attendants also provide highway related information to the motorists upon request.

Movable span structure attendants are on duty 24 hours a day, or as designated, and operate the movable span as required to permit the movement of waterway traffic through a channel.

Other services that are included in the annual work program of the Bureau of Maintenance are listed in the following section.

6.9.2. WORK ACTIVITIES

Work activities identified as service activities are as follows:

Activity No.	Activity Name
670	Installing Driveway Pipes Installation of driveway or crossover pipes and covering as necessary in accordance with Department of Transportation guidelines, to provide access to the State Highway System.
671	Work for Other Alabama Department of Transportation Units All work performed on a non-reimbursable basis for other Units or Bureaus of the Alabama Department of Transportation.
672	State Institution Work Shall maintain all roads within the boundaries of any state agricultural experiment station or of any branch or sub-station.

May maintain roads and streets, drives and parking areas located on the campus of any state institution of higher learning, the Alabama state hospital, the Partlow State School and Hospital and the Alabama Agricultural Center in the City of Montgomery.

May maintain roads leading from a state highway to a state park.

Section 3.3.1 covers the levels of authority needed to perform work on these facilities.

673 Truck Weighing Operations

Time spent by maintenance personnel for performing truck weighing operations. Does not include time spent by personnel from the Department of Public Safety.

674 Rest Area/Welcome Center Maintenance

Tending and maintaining rest areas and welcome centers on a continuous basis. Includes attendants salaries, mowing and litter pickup, care and cleaning of buildings and other duties necessary to maintain neat, clean facilities for public use.

675 Bridge Inspection

Inspection of bridges by State or Division Bridge Inspection crew to rate the bridge in accordance with AASHTO and FHWA inspection specifications. See Section 6.6 for "B" Codes which identify work activities for structures.

679 Other Service Activities

Other service activities that are not specifically identified as separate activities.

6.10. OVERHEAD AND SUPPORT

A certain amount of maintenance work and time must be classified as overhead and support activities. These include materials handling and stockpiling for another work activity, equipment transfer to a job-site, operation of the service truck for other maintenance work and time for meetings and training sessions for work methods, safety procedures and other formal training. These activities are part of the regular maintenance operations.

6.10.1. SERVICE LEVELS

The amount of overhead and support activities is controlled by other maintenance operations, equipment repairs required, weather and the established guidelines of the Department of Transportation relative to attendance at meetings and training.

6.10.2. WORK ACTIVITIES

The following maintenance work activities are identified as overhead and support:

Activity No.	Activity Name
680	Material Handling and Storage Handling and storage of materials used for routine maintenance, minor maintenance improvements, winter and emergency maintenance and service activities. Includes the loading, hauling, unloading, mixing, stockpiling and protection of materials. Note: This activity should not be used for any special maintenance activities.
681	Equipment Transfer Moving equipment and tools between storage yard and work location. Includes only those moves made by Highway Maintenance and Equipment Bureau personnel for routine maintenance activities. Equipment transfers for special maintenance activities should be charged to each special maintenance project.

Note: This activity does not include the movement of equipment to and from the shop for repairs. These repair moves should be charged to equipment maintenance.

682 Equipment Service and Repair

Includes the operation of the service truck and service and minor repair of SG-type equipment used for mowing, ditching, patching and other maintenance activities.

683 Standby Time

Standby time of two hours or more of maintenance personnel due to weather conditions, equipment breakdown or other situations prohibiting productive work.

684 Training

Time spent by maintenance personnel participating in training sessions.

685 Material Handling and Storage (Division-Wide Only)

Handling and storage of materials, used by division-wide crews, for routine maintenance, minor maintenance improvements, winter and emergency maintenance and service activities. Includes the loading, hauling, unloading, mixing, stockpiling and protection of materials.

Note: This activity should not be used for any special maintenance project.

686 Equipment Transfer (Division-Wide Only)

Moving equipment and tools, used by division-wide crews, between storage yard and work location. Includes only those moves made by Highway Maintenance and Equipment Bureau personnel for division-wide routine maintenance activities. Equipment transfers for special maintenance activities should be charged to each special maintenance project.

Note: This activity does not include the movement of equipment to and from shop for repairs. These repair moves should be charged to equipment maintenance.

687 Equipment Service and Repair (Division-wide Only)
Includes the operation of the service truck and servicing and minor repair of SG-type equipment used for pavement planing, concrete pavement repairs, centerline and edgeline painting, major bridge repair, and other division-wide maintenance activities.

688 Other Overhead/Support Activities (Division-wide Only)
Other overhead and support activities that are not specifically identified as separate activities and which are performed by division-wide crews. Includes activities Division-wide personnel perform such as:

+ traffic counts and studies.

689 Other Overhead/Support Activities
Other overhead or support activities that are not specifically identified. Includes activities such as:

+ traffic counts and studies.

6.11. SPECIAL MAINTENANCE AND IMPROVEMENTS

In addition to regular routine maintenance work efforts, maintenance personnel also perform special maintenance improvements and special maintenance projects. This work improves the elements of the roadway or structure to a level greater than the original facility.

6.11.1. SERVICE LEVELS

"Special Maintenance" is planned separate from routine maintenance requirements. The type and amount of this work to be performed will be controlled by availability of funds and annual project submissions from the divisions to the Maintenance Bureau.

6.11.2 WORK ACTIVITIES

Special maintenance activities are to be classified as follows:

Activity No.	Activity Name
690	Sign and Signaling Projects - CADD This function is specifically for use with the projects created for CADD operators only in the various CADD sections to charge their time on their time reports. Function 690 is not to be used by personnel in supervisory capacities.
691	Resurfacing and Special Maintenance Projects - CADD This function is specifically for use with the projects created for CADD operators only in the various CADD sections to charge their time on their time reports. Function 691 is not to be used by personnel in supervisory capacities.
692	Paved Shoulder Repair Projects
693	Resurfacing and Special Maintenance Projects - Preliminary
694	Sign Upgrading Projects Installation and maintenance procedures required to bring all signs on the State Highway System into conformance with the Manual on Uniform Traffic Control Devices. Work includes the installation of new signs and/or assemblies and the upgrading of existing signs and/or assemblies.
695	Traffic Signal Upgrading Projects Installation and maintenance procedures required to

bring all traffic signals on the State Highway System into conformance with the Manual on Uniform Traffic Control Devices. Work includes new signal installation and the upgrading of existing signal installation.

696 Resurfacing Projects

Liquid seal resurfacing and plant mix resurfacing of a continuous section of roadway on the State Highway System.

697 Structure Improvement Projects

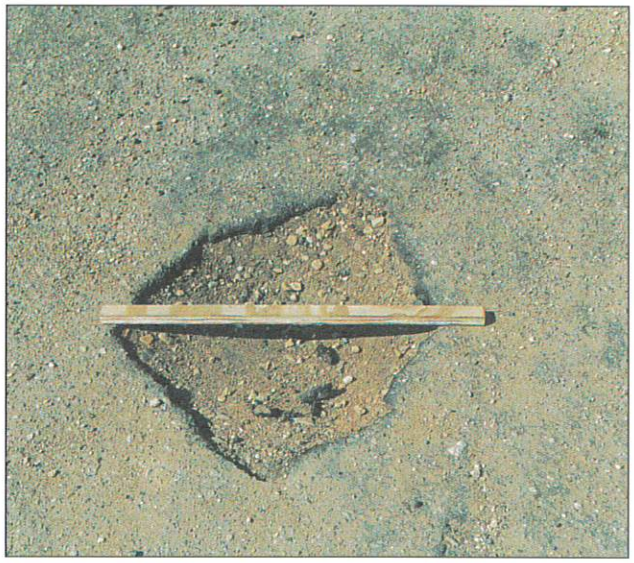
All improvements to existing bridges on State Highway System, above and beyond routine repairs, which increase load capacity or clearance or improve safety and convenience, beyond original design, such as strengthening of deck or other elements, widening or increasing vertical clearance or adding railings, sidewalks or lights. Each structure improvement project will be identified by a separate project number.

698 Other Maintenance Bureau Projects

Other special maintenance projects identified by the Maintenance Bureau. Each project will be identified by a separate project number.

699 Pavement Surface Planing Projects

Planing of pavement surface to minimize upheavals, surface irregularities, rutting and distortion. Includes planing at bridge ends, railroad crossings, intersections and for additional clearance.



Pothole

Edge Failure

Depression

Upheaval

FIGURE 6-1. Typical Roadway Surface Defects

Concrete Pavement Failure

Cracking

Raveling

Shoving

FIGURE 6-2. Typical Roadway Surface Defects

Built-up Shoulder

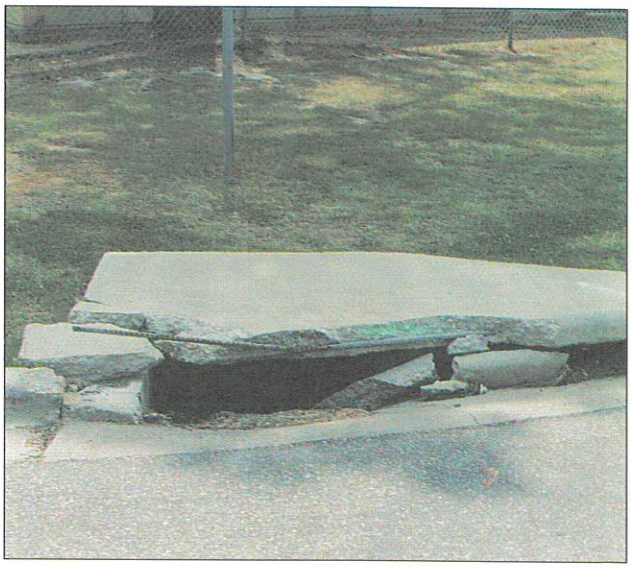
Low Shoulder

FIGURE 6-3. Typical Shoulder Defects

Blocked Pipe Culvert

Damaged Pipe Culvert

Scouring at Outlet



Damaged S-type Inlet

FIGURE 6-4. Problem Areas in Drainage Structures

Vegetation Blocking Ditches

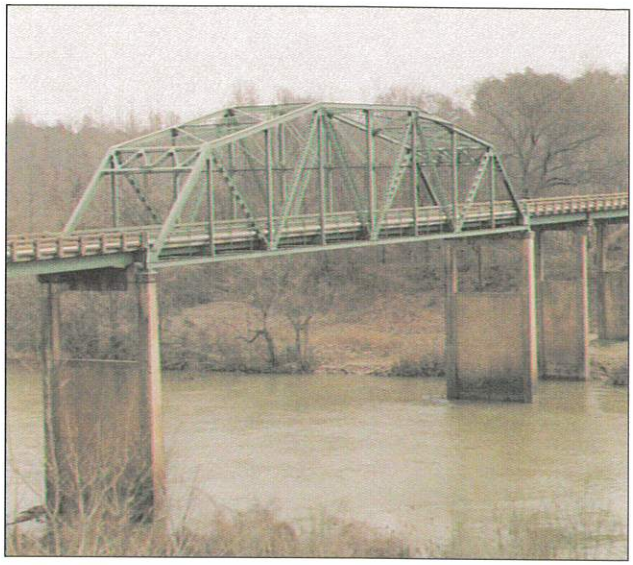
Scouring of Ditch Flowline

Silting of Paved Ditch

Displacement of Ditch Paving

FIGURE 6-5. Deficient Ditch Drainage Systems

Pre-cast Structure



Steel Truss

Combination Concrete Spans

Lift Span

FIGURE 6-6. Typical Bridges on Alabama Highway System

Chapter Eight

BRIDGE MAINTENANCE AND INSPECTION

8.1. INTRODUCTION

The Alabama Department of Transportation (ALDOT) has the responsibility for the maintenance and inspection of all bridges on the state system that carry vehicular traffic and of pedestrian overpasses over state routes.

Bridge structures represent the largest single investment item we have on the highway system. In order to protect this investment and, more importantly, to provide for efficient and uninterrupted traffic flow, a well-planned program of inspection, preventative maintenance, and programmed repairs is essential to the Department.

8.2. BACKGROUND

The mandating of maintenance of structures (including inspection) has been provided for in acts passed by Congress since 1916. Current requirements for bridge maintenance and inspections are a result of the December 17, 1967, collapse of the Silver Bridge over the Ohio River between Point Pleasant, West Virginia and Kanauga, Ohio which killed 46 people. This collapse and a subsequent investigation led to the issuance of a memorandum from the FHWA in March, 1968, directing a review and inventory of all existing highway structures by January, 1970.

During the latter part of 1968 and early 1969, this endeavor was pursued by the Department under the leadership of the bridge maintenance engineer.

In August of 1969, there was created within the Maintenance Bureau a Bridge Maintenance Inspection Section under the supervision of the bridge maintenance engineer. Initially, this consisted of a bridge maintenance inspection engineer and one assistant. Later that same year, a bridge maintenance inspector and one assistant were appointed in each of the Department's nine divisions.

8.3. AUTHORITY

The 1968 Federal Highway Act established national standards for bridge inspection. AASHTO and FHWA committees developed simultaneously the Manual for Maintenance Inspection of Bridges and the Bridge Inspection Training Manual based on the requirements of the 1968 Act and issued these in 1970.

The National Bridge Inspection Standards (NBIS) are issued under authority of 23 United States Code Section 151 (1988).

The NBIS were established and became effective in 1971, and were based on the AASHTO Manual for Maintenance Inspection of Bridges. The standards specified in detail the methods of inspection, the time between inspections, the qualifications of the inspectors, and required that each state maintain a bridge inspection organization.

The NBIS were revised in 1988 to address several areas of concern. Three primary areas of concern were brought to our attention as a result of the collapse of major bridges. In 1983, the collapse of the Mianus River Bridge on Interstate 95 in Connecticut brought attention to "fracture critical" bridges. In 1985, the collapse of the Chickasabogue Bridge on US 43 in Alabama brought attention to the need for more effective underwater inspection of bridges. The collapse of the Schoharie Creek Bridge in New York in 1987 brought greater concern to "scour critical" bridges.

In 1991, the Department published and adopted for use the Alabama Highway Department Bridge Inspection Manual. This manual is based upon the regulations set forth in the NBIS.

8.4. ADMINISTRATION

The Transportation Director has the authority to delegate the responsibilities of the Bridge Inspection Program to assure compliance with the NBIS. The Director delegated to the Maintenance Bureau the responsibility of administering the Bridge Maintenance and Inspection Program. The Director has instructed the Maintenance Engineer to have all state owned and maintained bridges inspected by the Department and all city owned and maintained bridges inspected by the city or their representative, and the data submitted to the Maintenance Bureau.

The Director instructed the County Transportation Engineer to have all county bridges inspected and the data submitted to the Maintenance Bureau.

The Maintenance Bureau is responsible for collecting all data and forwarding it to the FHWA as required in the NBIS. The Maintenance Bureau provides load capacity ratings for all structures and reports the need for posting to the owners. The Maintenance Bureau provides underwater inspection teams when requested by the Division. The Maintenance Bureau, in coordination with the Emergency Bridge Inspection Team, provides technical assistance to the Divisions, counties and cities as needed.

The Maintenance Bureau, along with FHWA, conducts reviews of the Division, county and city bridge inspection procedures and records to promote uniformity throughout the state and to ensure compliance with NBIS, FHWA, and Departmental policies, procedures, and guidelines. Each Division will be reviewed periodically. Representatives of counties and cities within the Division will be asked to attend. Following the Division reviews, a sampling of individual county or city reviews will be conducted as appropriate.

The maintenance and inspection of individual state bridges is the responsibility of the Division and/or District in which they are located. If a bridge crosses a Division or District line, the Division or District on the southern or western end of the bridge is responsible for its maintenance and inspection.

8.5. DIVISION BRIDGE INSPECTORS

Each Division should have a certified Chief Bridge Inspector as well as sufficient certified bridge inspectors and support personnel to accomplish all requirements of the bridge inspection program in a timely, accurate manner in accordance with the NBIS, FHWA, Department Bridge Inspection Manual, and Guidelines for Operation.

8.6. TRAINING AND QUALIFICATIONS

The Division Certified Bridge Inspectors should all meet the minimum qualifications set forth in Chapter 0 of the Department's Bridge Inspection Manual. The Maintenance Bureau is responsible for certifying bridge inspectors when these qualifications have been met.

Training is provided as discussed in Chapter 0 of the Department's Bridge Inspection Manual. Additional training on various aspects of bridge inspection is provided as it becomes available to the Department.

8.7. TYPES OF STRUCTURES

The NBIS apply to all structures defined as bridges located on all public roads. A "bridge" is defined as a structure including supports erected over a depression or an obstruction such as water, highway, or railway and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 6.1 meters between undercopings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

The roadway system in Alabama contains various types of bridge structures ranging from simple designs to modern complex designs. Some examples are pipe culverts, concrete box culverts, timber stringer, concrete slab, concrete tee beam, concrete girders (cast in-place and precast), trusses, cable-stayed, segmental box girders, tied arches, movable spans, lift spans, swing spans, and tunnels.

The variation of structure types vastly increases the experience and knowledge of bridges an inspector must possess in order to perform adequate inspection, and to be able to analyze inspection findings to determine bridge conditions.

8.8. FRACTURE CRITICAL BRIDGES

A fracture critical member is defined by AASHTO as a tension member or component of a bridge whose failure would be expected to result in the collapse of the bridge. Bridges which contain fracture critical members require more intensive inspection than other bridges. For more detail on the Departmental Guidelines on fracture critical bridges refer to Chapter 13 of the Department's Bridge Inspection Manual.

8.9. INSPECTION PROCEDURES

The field inspection of a bridge should be conducted in an organized and systematic approach that will maximize efficiency of personnel and equipment while minimizing the possibility of overlooking any bridge details. Clear, concise and detailed notes should be taken which can be easily interpreted when preparing the final report. Photographs and sketches should be made as needed to assist in describing bridge conditions.

Detailed procedures for all phases of bridge inspection are covered in annual training courses, with special emphasis on the hands-on approach to bridge inspection.

8.10. INSPECTION EQUIPMENT

To properly inspect a bridge it is important to have the necessary equipment and tools available. Bridge Inspectors should be familiar with the different types of equipment and tools, how to properly use them and the capabilities of each one.

The bridge inspection program was established to ensure that bridges provide an efficient and uninterrupted means of travel to the public using Alabama's roadway system. Likewise, the bridge inspectors should maintain a program of safety for themselves and other involved personnel while on the job. Following is a suggested list of useful safety equipment for bridge inspection.

Safety Equipment

1. All necessary site specific traffic control
2. Proper fall protection devices
3. Hard hat
4. Reflective vest
5. Safety shoes with non-slip soles
6. Safety glasses
7. Work gloves
8. Insecticide for wasps
9. First-aid kit
10. Life jacket
11. Flashlight or spotlight

12. Safety boat with lifelines when working over large bodies of water
13. Cartridge type filter mask for working around collections of bird droppings

Sometimes bridges are too high above the ground or are over deep water making the underside inaccessible using ladders, boats or working off the ground. In these cases, the inspector should have access equipment available. Underdeck inspection platforms, "Reach-Alls," "Bridgemaster Juniors," or other similar equipment should be available for use in these areas. Hydraulic lifts and bucket trucks are also helpful on overpass structures. In isolated cases, it may be necessary to use scaffolding with special rigging to gain access to all components of structures.

Many basic tools are needed to perform hands-on inspection of bridge members. Following is a list of suggested tools and equipment to be used in bridge inspection.

Tools and Equipment for Bridge Inspection

1. Field books, inspection forms, sketch pad, paper, pencil, clipboard, and keel marker
2. One thirty meter tape for measuring long, deformed sections
3. Folding rule for measuring sections and offsets of deformed members
4. Chipping hammer for cleaning heavily corroded areas
5. Scraper for removing deteriorated paint and light corrosion
6. Inspection mirror on a swivel head and extension arm for viewing inaccessible areas
7. Center punch for marking the ends of cracks
8. Calipers-dial (inside and outside), or micrometer, for measuring loss of section in webs, flanges, etc.
9. Crack indicator gauge or feeler gauges for measuring crack width
10. Camera (35mm) or video recorder for recording observed defects
11. Tool kit to carry tools
12. Dry film paint gauge for measuring paint film thickness
13. Large screw driver
14. Heavy duty pliers
15. Open end wrench

16. Flashlight for viewing darkened areas
17. Pocket knife
18. Wire brush for removing corrosion products
19. Dye penetrant kit and wiping cloths for examining small cracks
20. Magnifying glass for viewing suspected areas and small cracks along welds and around connections
21. Shovel for removing debris
22. Binoculars
23. Ultrasonic testing device
24. Testing hammer for checking connections
25. Cold chisel for marking reference points
26. Knife or ice pick for prying and picking to determine the extent of unsound timber
27. Prying tool for prying around fittings to determine: tightness, deterioration between surfaces, and extent of timber defects. DO NOT use a screw driver
28. Increment borer for taking test borings of timber members to determine extent of internal damage
29. Creosote plugs for plugging the holes made in the timber with the increment borer
30. Piano wire for measuring the depth of cracks
31. Tape recorder for recording narratives of deteriorated conditions
32. Extension ladder
33. Knee high boots, hip boots and chest waders
34. Carpenter's level
35. Plumb bob and line
36. Industrial crayon chalk/soapstone for marking cracks and marking on bridges
37. Spray markers in various colors
38. Surveyor's flagging in various colors
39. Sounding equipment for making profiles
40. Thermometer-air and contact
41. Magnetic particle testing equipment
42. Radiography equipment
43. Boat
44. Transportation capable of hauling other necessary personnel, tools and equipment

8.11. INSPECTION REPORTS

The Division Chief Bridge Inspector should maintain a file for each bridge in the Division in accordance with the NBIS. The files should contain all inspection reports and records on each bridge as outlined in Section III of Form BI-7 Field Review Check List shown in Appendix K of the Department's Bridge Inspection Manual.

8.12. BRIDGE RATING AND POSTING

Bridge Rating and Load Testing (previously known in part as Bridge Analysis and Rating) exists, in part, as per NBIS requirement for bridge inspection, rating, and posting, in order to ascertain the load carrying capacity of bridge structures in Alabama, including those structures which are owned and maintained by counties and cities, as well as state owned and maintained bridge structures.

The analysis and rating is performed routinely using a computer program, which is based on the AASHTO Maintenance Manual for Bridges and the AASHTO Specifications for Bridge Design. It is also performed using hand calculations, when the available computer program cannot perform the required rating for a particular type of bridge structure. For state owned bridges, a site visit is required to measure the various components in order to verify data kept in the bridge file, and to collect data on the size and location of any defect or deterioration that may have an effect on the structure's ability to carry a load. For county and city owned bridges, the responsible certified bridge inspector is required to furnish Bridge Rating and Load Testing with information for rating the bridge.

Seven different axle loadings and spacings, representing seven common vehicles of concern on the highway system, are tested and a load tonnage for each vehicle for each bridge is obtained. If the bridge has a computed load capacity for any vehicle less than the legal limit of that vehicle, posting is recommended. The rating compared to requirements concerning condition rating guidelines.

Posting information, including the reason for posting, is sent to the Division by Bridge Rating and Load Testing. The Division makes a final review and orders the appropriate signs for posting and advance warning using Form E-8. Signing is performed by district personnel. Subsequent notification of a posted bridge is sent to Bridge Rating and Load Testing as soon as possible. The bridge is then added to the Posted Bridge Map and the Posted Bridge List.

The items associated with the structural ratings on the Structural Inventory and Appraisal (SI&A) are modified by Bridge Rating and Load Testing. The HS equivalent for inventory and operating ratings are used when available. Previous information and the sufficiency rating are maintained in the bridge file along with the date of the modifications. When posting is complete, the Division Bridge Inspector modifies the appropriate code on the SI&A. Individual files are maintained on all state owned bridges which have been rated. Bridge Rating and Load Testing maintains one file for each county, containing all the bridges which Bridge Rating and Load Testing has rated for that county. Files on city bridges which have been rated are also maintained by Bridge Rating and Load Testing.

If a Division, county, or city wishes to have a specific bridge analyzed, a written request may be sent to the Maintenance Engineer for state and city bridges or to the County Transportation Engineer for county bridges. If a Division, county, or city wishes to physically modify a bridge, a sketch may be submitted to Bridge Rating and Load Testing for review. If the bridge is physically modified, Bridge Rating and Load Testing must receive a sketch or letter describing the modification for the bridge file.

8.13. BRIDGE LOAD TESTING

Over the last few decades, it has been discovered, through physical tests, that bridges are generally capable of carrying larger loads than can be predicted by conventional analytical rating procedures, notwithstanding apparent deterioration and/or age. The factors which contribute to this higher than predicted strength include load distribution effects, unintended composite action, end fixity, support restraints (unintended continuity), impact factors, participation of floor system and actual versus assumed material properties among possible others. These are factors which can only be fully identified, quantified and accounted for by the performance of nondestructive live load tests. These tests also augment and enhance the existing analytical rating procedures as well as the overall bridge inspection and management program.

In recent years, theoretical analysis of older bridges has resulted in a number of these bridges being posted for reduced load limits. Posted bridges have an adverse effect on trucking and other Alabama industries. The cost savings of performing a load test and allowing the bridge to remain in service or removing load restrictions outweighs the cost of major repair or replacement.

The above factors along with a successful pilot program by Auburn University led the Maintenance Bureau into establishing Bridge Load Testing in January of 1990. In July of 1992, Bridge Load Testing was joined with Bridge Analysis and Rating to form Bridge Rating and Load Testing.

The benefits and goals of nondestructive load testing include the following:

1. remove or upgrade load restrictions on bridges currently posted by analytical rating methods,
2. postpone or eliminate costly strengthening and/or replacement,
3. identify critical elements for repair and/or strengthening,
4. extend service life,
5. improve overload permit application ,
6. allow better planning of repair and/or replacement options, and
7. investigation of bridge behavior for circumstances not otherwise explainable.

The general methodology of load rating bridges by nondestructive load testing includes the following key activities:

1. preliminary investigation of bridge files/cards,
2. perform field inspection,
3. selection of test method and criteria for evaluation,
4. execution of load test,
5. evaluation of test results, and
6. report findings.

The Bridge Bureau provides structural assistance and participates in the load test program when requested. The various Division offices support the program by providing access to the bridges when required; i.e., snooper or platform and the necessary traffic control.

8.14. UNDERWATER BRIDGE INSPECTION

The Underwater Bridge Inspection Unit in the Bridge Section of the Maintenance Bureau is responsible for the inspection of any submerged portions and the surrounding areas of state maintained bridges that the Division bridge inspectors are unable to inspect. The unit is composed of seven divers/underwater bridge inspectors, proficient in underwater inspection, construction and repair. These divers (classified as Underwater Bridge Inspectors I, II, or III) are based in the Central Office complex, but travel statewide in teams of two divers each, to work in each Division as the needs require.

To accomplish their underwater inspection, the teams use the same skills and tools used by topside inspectors plus some specialized equipment such as surface supplied diving gear, scuba, recording fathometers, seismic profiles, 3-D plotters, decompression chambers, underwater videos and still cameras, compressors, underwater NDT instruments and boats. Their methods of inspection are outlined in Chapter Ten of the Department's Bridge Inspection Manual and in a Safe Practices and Procedures Manual.

8.15. ALABAMA BRIDGE INFORMATION MANAGEMENT SYSTEM (ABIMS)

In previous years, bridge inspection and maintenance were routine parts of the Department's bridge maintenance program. Today, these procedures have become more organized and highly technical in nature to provide more accurate data for substantiating bridge needs. Since funding for bridge repair, rehabilitation and replacement is so limited, care should be exercised in expending these funds to maximize their impact.

Recognizing the need for this increased level of data collection and anticipating forthcoming federal legislation, the Department began in 1990 to develop a bridge management system. The Alabama Bridge Information Management System (ABIMS) is to be used to store, evaluate and utilize this bridge data to optimize the use of limited bridge funds through better documentation of bridge needs, their corresponding treatments, and how that treatment performed over time.

To efficiently support ABIMS, detailed reports of work accomplished on each bridge structure should be submitted when appropriate to provide for determining the long term costs of maintaining each bridge. With this type of information collected over a period of time, the Department can make decisions on which bridge types are most cost-effective to build and maintain. Also, through this type of reporting, problems with a design or a construction procedure

may be discovered, allowing the Department to make adjustments to prevent future maintenance problems.

8.16. BRIDGE MAINTENANCE

In order to protect the Department's investment in bridges and ensure efficient and uninterrupted traffic flow, a planned program of preventive maintenance should be an integral part of the highway maintenance program.

During each bridge inspection, Form BI-9, Bridge Maintenance Estimate, is completed by the inspector in order to relay needed preventive maintenance and repairs to the Division Maintenance Engineer and the District Engineer. Maintenance or repairs should be scheduled and completed as soon as practical within current manpower and funding limitations, and according to the urgency of the need. Remember, most problems can be prevented or minimized by timely preventive maintenance.

Routine maintenance items on bridges should be initiated and completed as needed in order for the structure to function properly and to prevent costly future repairs. These items include, but are not limited to, drift removal, channel stabilization, joint cleaning, joint sealing, approach leveling, deck cleaning, drainage element cleaning, bearing assembly cleaning, painting and lubrication, spot painting, fireproofing, and truss joint and chord cleaning.

Many routine maintenance items can be completed by district crews. Other repairs which may require more expertise and equipment not available in the district may be performed by Divisionwide bridge crews. The Bridge Section of the Maintenance Bureau has available on request two statewide bridge crews who can handle most repairs from minor to major or routine to emergency.

Repairs that are beyond the capabilities or manpower availability of state maintenance forces may be let to contract within the limits of available funding.

Routine maintenance activities have been defined for bridges, culverts, and other related structures. These activities have been defined and described using the recommendation of the ABIMS's Project and User Committees. The activities provide the basis of planning and reporting structure maintenance and operation work. These activities are usually referred to as

the "B" codes. They are identified as B01 through B40 and B99. They are described in Section 6.6.2.

The "B" codes are used to report needed or planned and to report work accomplished by the work crews. The "6xx" codes are used only in the MMS to summarize and to include information in the MMS reports. The "6xx" codes are not to be used to report needs or accomplishment.

Chapter Nine

EQUIPMENT

9.1. INTRODUCTION

The equipment required by the Department of Transportation to carry out its various functions represents a substantial investment of funds. To ensure that this investment is properly managed, the Bureau of Equipment, Procurement and Services has been assigned the responsibility for arranging for the purchase of equipment, services and supplies, providing policy on maintaining and repairing equipment, and salvaging and disposing of all major equipment. The Bureau of Equipment, Procurement and Services is also responsible for maintaining a perpetual inventory and a current record of the assignment, and location of all Department equipment with a useful life of one year or more, or a cost or value of $100.00 or more.

9.2. ALLOCATION OF ACQUISITION COSTS

All equipment acquisition costs are allocated to the work activity or project on which it was required. These costs are allocated by different methods according to the type of equipment. The two methods of allocating equipment costs are:

1. Replacement Cost System.
2. Direct Cost Allocation.

9.2.1. REPLACEMENT COST SYSTEM

The Replacement Cost System is used for major equipment owned by the Department and rented to Department users (aircraft, automobiles, trucks, and most motorized and wheel-mounted highway maintenance equipment). The Department does not have an annual budget to purchase replacements for this rental equipment, but generates funds from charges to the user for this type replacement. This replacement program was codified by Alabama Code Section 23-1-50.1 (1994 Cum. Supp.). This statute was intended to provide funds for replacement of existing equipment and cannot be used to increase the number of units.

This act also allows the Department to use replacement funds to upgrade or to make extraordinary repairs to Department rental equipment when economically feasible. The criteria for making extraordinary repairs is as follows:

1. It must extend the life of the unit.
2. It must be a major renovation. (Consideration should be given if repair costs exceed 25 percent of the current replacement cost).
3. Extraordinary funds must be used when upgrading equipment from one basic code to another. For approval procedures for extraordinary repairs, see the Department Equipment Manual Chapter 4.

For the Department to be able to maintain sufficient funds to replace rental equipment, it is necessary to charge users usage fees (rates) for:

1. Depreciation Cost - The actual equipment cost amortized over the useful life of the equipment.
2. Replacement Cost - The difference between the actual cost and a projected replacement cost.

Also used to accumulate replacement funds are:

1. Salvage Value - The amount of funds that are received upon disposal of equipment.
2. Insurance Claims - (Total Losses) Funds that are received when other parties are liable.

To assure full utilization of the Department equipment and the accumulation of adequate replacement funds, a minimum monthly charge is established for all rental equipment.

9.2.2. DIRECT COST ALLOCATION

The acquisition cost of non-rental equipment is charged directly to a project, maintenance work activity or "Other Equipment" account. The acquisition cost of small tools is charged to the area of use. All subsequent repairs are charged directly to one of these activities. Equipment subject to direct cost allocation is identified by two separate categories as follows:

1. S. G. Equipment - Equipment costing $100.00 or more and/or having a useful life of one year or more, such as rotary mowers, pumps, jacks, pavement breakers, etc., are included in this category. This equipment is assigned an S. G. number and is carried in the property inventory.

2. Small Equipment - Tools and small equipment that costs less than $100.00 and with a useful life of less than one year are considered "expendable" and are not carried in the property inventory; however, expendable equipment costing between $50.00 and $100.00, such as drills, saws, etc., are assigned a Division or Bureau number for accountability.

9.3. EQUIPMENT OPERATION COST SYSTEM

The costs associated with operating major pieces of rental equipment are allocated to the users of the equipment through an equipment rental rate system. Rental rates are calculated for each Division and the General Office by the Bureau of Accounts and Finance to cover equipment costs such as fuel, lubricants, tires, tubes, parts, supplies, direct labor and indirect labor. The rates are reviewed annually and adjusted as needed to ensure that the actual operating costs are recovered.

Five different types of rental rates are used to allocate equipment costs to the users. They are as follows:

1. Odometer Rate - Rental rates for most automobile and truck type equipment are based on odometer units of usage.
2. Fuel Consumption Rate - Most motorized maintenance equipment rental rates are based on units of fuel consumed. This group includes heavy equipment such as tractors, motor patrols, and other motorized equipment.
3. Hourly Rate - This covers equipment that would not fit the other rate criteria such as pull-type rollers.
4. Daily Rate - This is the rental rate that is charged for equipment that is loaned out of the equipment pool.
5. Tenths of an Hour Rate - This rate is for aircraft.

9.4. EQUIPMENT PURCHASING

9.4.1. MAJOR ITEMS

All rental pieces of equipment are purchased by the Bureau of Equipment, Procurement and Services and rented to the various users in the Department. For control purposes, a state number is assigned to each piece of new rental equipment by the Bureau of Equipment, Procurement and Services.

Quarterly, each Division and the General Office reviews its needs for rental equipment replacement. This effort is assisted by the Rental Equipment Average Monthly Usage Report PGMEQ22REAU. This report provides such data as usage-to-date, the average monthly usage, expected replacement date, and net operational cost.

After reviewing this data, management can select replacement equipment in conjunction with other data, such as equipment that has been wrecked or units not economically feasible to repair. After the replacement needs are established, then the determination of available funds to each Division or the General Office must be determined by reviewing the Equipment Revolving Fund Status Report PGMEQ22RFSR. This report provides the funds that have been accumulated by each piece of equipment for the current month and a total accumulation. To determine the Total Funds Available, the following items must be added:

1. Total funds accumulation.
2. Proceeds from sale of equipment.
3. Funds accumulated on salvage, sold, and transferred equipment.
4. Insurance claims on total losses.

Less the following items, which are Allotted Funds:

1. Transferred to equipment appropriation purchases.
2. Transferred to equipment appropriation enhancements.
3. Cost of sale.

The difference between the Total Funds Available and the Allotted Funds will equal the Unallotted Fund Balance. The Unallotted Fund Balance is the money that is available to be expended less any retainage or restrictions that are established by the Director of Transportation.

Once the needs and the funds available to cover these needs have been established, each Division and Bureau must submit one copy of a completed Form E-19 for each equipment basic code.

Also, each Division and Bureau must submit two copies of the Finance Department's Justification Form (OFM-33) for each piece of rental equipment requested. These forms must be completed fully and attached to the E-19.

Each Division and Bureau should submit a "Summary of New Equipment on Order" form giving a brief description, the basic code, quantity, unit cost, total cost, and replacement numbers. This form should give a brief description of what is being requested, and it must be in numerical sequence beginning with the lowest basic code. Along with the E-19, justifications, and summary, a letter of transmittal is required. The letter of transmittal and attachments are sent to the Equipment Bureau by the twentieth (20th) of the month following the end of each quarter. See Chapter 4 of the Equipment Manual for additional guidance.

9.4.2. MINOR ITEMS

Small pieces of equipment such as shovels, brooms, hand tools, etc., are usually available from the division warehouse inventory through use of Field Requisition for Supplies, Form E-8. Repair parts may be purchased locally when not available in the Division or District warehouses, using a Local Delivery Order, Form E-7. To purchase any other equipment or supplies, it is necessary to submit a Purchase Requisition, Form G-9, to the Department's Procurement Office. For more details, see the Fiscal Policies Procedures and Forms Manual Volume 1-C and Chapter 10 of this manual.

All minor items purchased locally become the property of the State. Those items of equipment that cost $100.00 or more, or that are not considered expendable, are assigned an S. G. number and added to the equipment inventory. (Note: Requisitions for S. G. equipment that are purchased with Maintenance monies (account 9XXX) or for 2XXX 717 inventories must be submitted to the Maintenance Bureau for approval.)

9.4.3. COMMERCIAL EQUIPMENT RENTAL

If a unit of equipment located in the statewide pool is out of service for repairs, already being used, or if the type of unit is not owned by the State, then commercial units can be rented.

The Department of Finance, Division of Purchases and Stores, has obtained equipment rental contracts with various equipment vendors throughout the state. The general terms and conditions that both parties must abide by are listed at the beginning of the contract. The type of equipment that is covered in this contract is listed in the current edition of the "Rental Rates Compilation" that is compiled by the Associated Equipment Distributors or any list or attachments that vendors have attached to their bids.

If the need arises to rent a piece of equipment using this contract and the equipment is available at the desired location, select the lowest bid and arrange for the equipment rental. However, if the lowest bidder cannot provide the equipment, he must provide written certification stating this fact. Proceed to the next low bidder and continue until exhausting all bidders on contract. Upon selection of the low contract bidder, a confirming requisition should be made listing the contract number in the appropriate location. If the equipment is not available using contract sources, the Division can secure prices locally and contact the Procurement Office for authorization if the anticipated rental does not exceeds $5,000.00. If the anticipated rental exceeds $5,000.00, a regular requisition should be prepared and sent to the Procurement Office for processing.

9.5. CARE OF EQUIPMENT

9.5.1. EQUIPMENT MAINTENANCE AND REPAIR

The Equipment Maintenance Superintendent has overall responsibility for maintaining and repairing equipment in the Division. Responsibility for routine preventive maintenance and repairs is assigned to equipment maintenance personnel in the Division and District shops.

Manufacturer's service manuals should be available for each type of equipment used. If not, service manuals should be ordered from the manufacturer. Each employee involved in equipment maintenance and repair must be familiar with the manufacturer's recommendations as well as Department procedures. See Equipment Manual Chapter 10 for more details in this area.

9.5.2. SAFEGUARDING EQUIPMENT

All accountable property (item assigned a state number) is assigned to an accountable individual. If equipment is loaned out to another organization within the department, a signed receipt should be obtained for temporary loans and an E-18-B, Property Transfer Report should be completed if the loan will be long term (over thirty (30) days). Failure to properly safeguard equipment could result in the accountable person being charged for the loss. See Chapters 8 and 9 in the Equipment Manual for more details in this subject area.

9.6. OPERATOR'S RESPONSIBILITY

9.6.1. OPERATION

Personnel should not be assigned to a piece of equipment unless they are qualified to operate such equipment. The operator must have a valid driver's license, and should be trained, or in the process of being trained (supervised), to use the particular piece of equipment. The District Engineer and/or Operator's Supervisor should provide on-the-job training for equipment operators to ensure proper operation of equipment. Operators of trucks over 11 794 kg. (26,000 pound) gross vehicle weight rating, those towing a 4536 kg. (10,000 pound) or greater gross weight trailer and those operating Buses/Vans that carry 16 or more passengers and those carrying hazardous materials are required to have a Commercial Drivers license (CDL). Equipment in these categories cannot legally be operated without a CDL. The equipment operator is responsible for the proper use of equipment assigned to him. This responsibility includes performing the daily maintenance checklist, having the preventive maintenance inspections performed when due, and any other maintenance as prescribed in the Equipment Manual. Willful misuse and negligence may result in loss of pay, demotion or dismissal if it is determined that such action is warranted.

While equipment is being used, operators should be alert to conditions that could cause injury to themselves and others. Caution should be taken when operating equipment on steep slopes or in the vicinity of power lines, traffic lanes, other equipment or fellow workers. See comments in Chapter Eleven, WORK AREA SAFETY.

9.6.2. REPAIRS

Operators should be alert for defects in equipment and symptoms which indicate problems, such as excessive noise or vibration, overheating, smoke, loss of power, malfunctions, difficult starting, and other unusual situations. Such symptoms should be reported to the Equipment Repair Shop by the operator or his or her immediate supervisor using a Work Request and Discrepancy Report (Form E-2). If it appears that continued operation of the equipment would cause further damage or would be hazardous, operation of the equipment should be stopped until it is repaired.

Normally, repairs are made in the shops or at the work location by mechanics. However, certain repairs or servicing may be made in the field by equipment operators if they are properly trained, and proper tools and replacement parts are available. Examples of such activities would be changing tires and replacing mower blades, shear pins, and fan belts.

9.6.3. FUEL

Fuel for Department equipment should normally be obtained at Department or other state agency pumps. If this is not practical, purchases can be made from private service stations.

There are four types of credit cards used to obtain fuel. One is for state pump use only. The second card which is not limited to "State Pumps Only" can be used at state pumps and private service stations. The third card is a special card that identifies an individual's name. The fourth card is a national credit card such as BP, Exxon, etc., that is issued by the Procurement Office for out-of-state travel. For credit card issues of petroleum products, the fuel issue is recorded on a credit card form and charged to the receiving equipment or activity. (NOTE: Equipment number and units of usage shown on the equipment odometer/hour meter must be recorded on all credit card forms.)

In emergency cases and for some issues from mobile service trucks, a Form E-9, Fuel Consumption Report, can be used to document fuel issues. For more details in this area, please refer to the Equipment Manual, Chapter 6.

9.6.4. PARKING UNATTENDED VEHICLES

Occasionally, it is necessary to leave equipment unattended for short periods of time. Examples of this include:

1. Equipment breakdown.

2. Idle time during other operations.
3. Inclement weather.
4. Overnight parking near job site.

When equipment is left unattended along the roadway for any length of time, care should be taken to park or place the equipment in such a manner that traffic flow will not be hampered. Special precautions should be taken to prevent theft or vandalism of the equipment. Any theft or vandalism should be documented by a police report.

9.6.5. AUTHORIZED USE

Vehicles and other equipment owned by the Department are for official use only. No employee assigned State equipment may use the equipment except in the line of duty. However, when specifically authorized by the Director of Transportation, it is permissible for employees to use motor vehicles for travel to and from their place of residence.

9.7. REPORTING USAGE

An Equipment Use Report, Form E-12T, must be submitted each month for each piece of equipment under the rental and replacement system, whether the equipment was used or not during the month (Equipment operators or foremen are also responsible for reporting equipment usage to the district office on a daily basis, using the Crew Day Card). Monthly E-12T reports are prepared in triplicate at the district office. The original and duplicate are sent to the division office, and the triplicate copy is retained at the district office. The duplicate is retained at the division office and the original is forwarded to the Bureau of Accounts and Finance.

If a piece of equipment has a rental rate based on usage, the odometer reading at the beginning and end of the reporting period is recorded. The difference between the two readings is the units used. The actual quantity of fuel placed in the piece of equipment is to be reported for equipment with fuel consumption usage rates. The beginning and ending hour meter readings must also be recorded in the odometer section of the form for this equipment.

Usage of equipment having hourly rates is to be reported in hourly units. The beginning and ending hour meter readings must also be recorded in the odometer section of the form for this equipment.

There is a minimum amount of usage charged for pool equipment with an odometer and a whole day for all other types. The charges begin on the day the equipment is transferred out of the pool and end on the day the unit is returned. The eight (8) divisions outside the Montgomery area will be allowed one day of travel time without minimum charges. This day is usually allowed on the return day. See the Equipment Manual (Chapter 4) for additional guidance in this area.

9.8. CHARGES TO EQUIPMENT

9.8.1. CHARGES TO RENTAL EQUIPMENT

Once a piece of rental equipment becomes inoperative, all charges for repairs, servicing, and transportation of the equipment should be made to the inoperative equipment. The exception to this procedure involves accidental damage, and consideration should be given to charging a user account, or the operator personally, if neglect in operating the equipment is proven.

All transporting of equipment, except for repairs, should be charged to the user's activity and not to the piece of equipment. See the Equipment Manual (Chapter 14) for additional guidance in this area.

9.8.2. CHARGES TO NON-RENTAL EQUIPMENT

All repairs to non-rental equipment must be charged to maintenance, a project, work in process, or overhead account. When costs are charged to maintenance, they are charged either to a major activity, or to servicing and minor repairs. The guidelines for these charges are as follows:

1. Where a service truck and personnel or any service-type vehicle and personnel perform "on-the-job" service and minor repair of SG equipment used for mowing, ditching, patching, and other maintenance activities, charges shall be to Activity 682.
2. Where shop equipment and personnel perform "start-up" or "shut-down" service and minor repair of SG equipment used for mowing, herbicide, patching, and other maintenance activities, charges shall be made to Activity 682.
3. Where a service truck and personnel or any service-type vehicle

and personnel perform "on-the-job" major repairs or major component replacement on SG equipment used in maintenance activities, charges shall be made to the major-use activity (for mowing, use 625, etc.).

4. Where SG equipment is brought into the district or division shop for major repairs or major component replacement, charges shall be made to the major-use activity (for mowing, use 625, etc.).

Chapter Ten

MATERIALS

10.1. REQUIRED MAINTENANCE MATERIALS

Materials are required for the majority of routine maintenance work performed by maintenance personnel. The Performance Standards contained in the Field Operations Manual identify the major types of materials required for each maintenance work activity.

The Maintenance Management System provides an annual Material Requirements Report, MM 608, that identifies for each division and district the estimated materials, by type and quantity, that will be required to perform the planned annual workload for all routine maintenance work. This report can be used as the basis for ordering materials and assuring that they are available for use when required. An example of the Material Requirement Report is shown in the section of this manual on “Forms.”

10.2. MATERIAL ACQUISITION

Division and district offices plan for the acquisition of required maintenance materials well in advance of their actual need. Certain materials can be stockpiled or kept in inventory for use as required. Other materials must be scheduled for delivery on the day of planned usage, e.g., hot bituminous materials, ready-mix concrete, etc. Materials may be obtained by any of the following methods:

1. Regular Purchase Requisitions and Contract Release Order
2. Transfer from Division to Division
3. Transfer from Division to District
4. Transfer from District to District
5. Department Owned or Royalty Material Pits
6. Local Delivery Orders
7. Emergency Purchase/Repair Authorization (Form EP-10)
8. Emergency Purchases

10.2.1. REGULAR PURCHASE REQUISITIONS

Purchase requisitions for materials are initiated at the district, division or general office level. These may be either for (1) a request for bids on the materials; or (2) a request for materials from a vendor previously established by State Purchasing, Contract Release Order.

Regular purchase requisitions, including contract release orders, are entered through the State Network for Automated Procurement (SNAP). Reference is made to Chapter Five of the Department's Equipment Manual for a detailed procedure of submitting and processing regular purchase requisitions.

10.2.1.1. General Office Requisitions

Materials that are normally purchased in quantities too large for individual division use are requisitioned by the Bureau of Maintenance based upon the needs of the divisions. Included are materials such as paint for painting centerlines and edgelines, glass beads, aluminum sheeting and other materials used primarily by state-wide or division-wide specialized crews. Shipments of these materials are to be made only upon request by the division and shipped directly to the division whenever possible.

Office supplies, including printed forms, stationery and other supplies, are purchased and stocked at the Department's Central Supply in Montgomery. Requests for these supplies by the district or division office are submitted through the division office on Field Requisition for Supplies, Form E-8.

10.2.1.2. Division Requisitions

Material requisitions from the divisions are to include estimated material requirements from the District Engineers and other maintenance personnel supervising maintenance work in the division. Estimates for major materials can be based on the Material Requirements Report. These requisitions are submitted by computer terminal through the SNAP Purchasing System (State Network for Automated Purchasing).

The requisition should specify the date and location of delivery. Sometimes it may be desirable to stockpile sand, gravel, etc., at the job site. Whenever possible, vendors should be requested to make deliveries of materials to the place of use. Seasonal items such as calcium chloride, fertilizer, herbicides, etc., should be requisitioned well before the dates of actual need.

Purchase Requisitions are processed in Montgomery by the office of Equipment, Procurement and Services. A Purchase Order is issued by the Finance Department and sent to the vendor when a Purchase Requisition is approved and copies are sent to the requesting authority. The vendor must deliver exactly what is specified on the Purchase Order.

No changes in specifications, price, quantity, place of delivery or account number are to be honored by the receiving authority. If changes of this type are necessary, a Purchase Requisition Change Request, Form G-9B, is to be prepared and submitted in the same manner as the Purchase Requisition.

Selected materials and office supplies are available from lists of contract items that identify the vendor, pre-established bid price and minimum quantities to be ordered. A regular requisition (SNAP) coded "REL" is used to order items by contract release and is submitted to the Department's office of Equipment, Procurement and Services for these items. A regular purchase order will be issued to the contract vendor by State Purchasing.

Office supplies not identified as contract items may be requisitioned from Central Supply by submitting a Field Requisition for Supplies, Form E-8. Other office supplies not available from Central Supply or contract vendors are to be requested on Regular Requisition (SNAP) and forwarded to the office of Equipment, Procurement and Services in Montgomery.

10.2.1.3. District Requisitions

District Requisitions for materials may be transmitted through the division office by means of a Regular Requisition, SNAP, as explained in the preceding section. Other supplies are requested from the division by use of Field Requisition for Supplies, Form E-8.

10.2.2. DIVISION TRANSFERS

Divisions may transfer materials between divisions when materials needed by one division are available at another division. When this transfer is performed, a Transfer Invoice, Form G-1, is completed in order to remove the material from one division's inventory and place it on the other division's inventory. The original copy of the completed Transfer Invoice, Form G-1, is then submitted to the Bureau of Accounts and Finance.

Normally, these transfers should be performed only when the material is not needed immediately by one division, and the urgency of the need by the other division prevents obtaining the materials through regular requisition processes.

10.2.3. DISTRICT TRANSFERS

Occasionally, a district may need materials which are available in another district, rather than at the division office. Informal agreements may be made in which both parties agree on how repayment will be made. When the transaction is formal, the Transfer Invoice, Form G-1, is submitted to the Division Engineer. The Transfer Invoice removes the material from one inventory or account and records it on another. The original copy of the completed Transfer Invoice, Form G-1, is then submitted to the Bureau of Accounts and Finance.

10.2.4. DEPARTMENT OWNED OR ROYALTY MATERIAL

Aggregate, sand, and other natural materials often are available from land owned or rented by the Department. When these materials are available and meet material specifications, they can be used when it is determined that it is more economical than purchasing from a commercial supplier through Purchase Order.

Materials may also be obtained from tested and approved privately-owned pits. Purchase Requisitions and copies of Materials Option, Form BMT-62, are submitted to cover material needed. Payment is made to the property owner for the actual quantity of material removed. The owner must submit Property Owners Invoice, Form G-15. A historical and archaeological clearance is required and can be obtained from the Alabama State Historical Preservation Office through the Department's Environmental Section as called for by the current Alabama Department of Transportation Standard Specifications. Commercial sources, supplying parties other than the Alabama Department of Transportation, are responsible for obtaining historical, archaeological and storm water clearances/permits.

10.2.5. LOCAL DELIVERY ORDERS

In some cases, it is not practical to maintain an inventory of certain supplies, yet the supplies are often needed without delay. Purchases of parts and supplies for ST equipment and parts and supplies for traffic signal maintenance may be made on Form E-7, Local Delivery Order. LDO purchase orders may not exceed $7500.00 unless specific written approval has been obtained from State Purchasing.

Reference is made to Chapter Three of the Department's Equipment Manual for a detailed procedure on the use of Local Delivery Orders (LDO's) in the purchase of supplies.

10.2.6. EMERGENCY PURCHASE/REPAIR AUTHORIZATION (FORM EP-10)

These purchases are used to obtain commodities and/or services that are needed immediately. They are documented using a Form EP-10 and a Material Receipt denoting that it is a Confirming.

There are three (3) monetary categories of confirming purchases. The first category is $0.00 - $250.00. Each Division Engineer is authorized by the Director to purchase items in the $0.00 - $250.00 range except for equipment costing $100.00 or more which has to be approved by the procurement office. Bureaus must contact the Procurement Office for an authorization in this category.

The second category is the $250.00 - $7500.00 range. In this category, the divisions and bureaus must contact the Department Procurement Office for approval. The Procurement Office obtains approval for these requests from State Purchasing.

Reference is made to Chapter Five of the Department's Equipment Manual for a detailed procedure of approval and documentation required for emergency purchase/repair authorization, Form EP-10.

10.2.7. EMERGENCY PURCHASES

The Transportation Director has the authority to declare a state of emergency under circumstances that involve the safety and health of the general public. After written notice to the Finance Director, the Transportation Director may authorize any expenditures required for the emergency in accordance with the Alabama Code Section 41-16-23 (1991 Repl. Vol.).

10.3. RECEIPT OF MATERIAL

Verification must be made of all materials received by the Department of Transportation before payment can be made. Material which does not conform to the specifications of the Purchase Order cannot be accepted by Department personnel.

The employee authorized to accept the delivered material checks the condition and verifies the quantity of delivered material. Damaged or otherwise unacceptable goods and materials are to be noted and called to the attention of the delivering agent. Damaged or unacceptable material is noted on the original copy of the delivery receipt. Then the Department's copies of the delivery receipt are sent with accompanying letters to the vendor and to the division office. Also a Material Receipt, Form G-3, showing only the acceptable good delivered is prepared and sent to the division office. This ensures that the Department will be billed for only the acceptable goods and serves as the basis for payment to the vendor.

Delivery Receipts and Weight Tickets for acceptable materials are to be signed by the authorized employee and attached to the Material Receipt, Form G-3. Material Receipts are to be prepared for each day's delivery of materials.

Materials received from Department inventories are accounted for and controlled by use of Form G-1, Transfer Invoice. See Sections 10.2.2. and 10.2.3.

10.4 MATERIAL SPECIFICATIONS

Material used to repair existing facilities should conform to the specifications of the original material used in construction whenever feasible. Material used to upgrade existing roadways or structures should conform to specifications established by the Department.

10.5 MATERIAL USAGE

The Maintenance Performance Standards identify the major types of materials to be used in all maintenance work activities. These Performance Standards also present the recommended methods and procedures for proper use of the materials. Specific maintenance work methods training courses provide additional training and instructions in the proper use of maintenance materials for major maintenance activities. Materials not covered by the Department's specifications should be applied according to the manufacturer's recommended application rates.

10.6 REPORTING MATERIAL USAGE

The Alabama Maintenance Crew Day Card is used to report all major types of materials used during the day for each maintenance work activity. Major materials to be reported and the appropriate codes are found in the Appendix of the Field Operations Manual. All material usage on the Crew Day Cards is to be reported to the nearest tenth of a unit. These reported material data are used to develop cost distribution reports for maintenance activities and average daily usage for a crew day of work.

Material usage reported on the Crew Day Card also may be used to report material allocations on the Transfer Invoice, Form G-1, showing the appropriate maintenance activity which correlates with the proper 6XX function code for maintenance activity as specified under the heading "Function Codes", sub-heading "Maintenance-General" in the S.P.P. & I., Accounting-General Volume II, Section 3.1. The original copy of the Transfer Invoice, Form G-1 is submitted to the Bureau of Accounts and Finance for processing.

Chapter Eleven

WORKER SAFETY

11.1 WORK AREA SAFETY

Maintenance crews perform work in areas that have various types of hazards and dangers.

Work area dangers can be minimized and on-the-job accidents can be reduced by utilizing safe work methods and proper safety equipment. Accidents involving roadway traffic can be reduced by implementing the proper traffic control procedures contained in the Manual on Uniform Traffic Control Devices.

11.2 WORK SITE MANAGEMENT

The work site should be managed by supervisory personnel so that the workers and the equipment are positioned in a way that the roadway traffic is least hindered and the maintenance crew is most protected.

Warning devices should be used where ever crews and equipment are working. The procedures outlined in the Manual on Uniform Traffic Control Devices should be used for installation of the safety devices.

If possible, equipment should be parked off of traveled lanes, off of paved or unpaved shoulders, and far enough away from traffic to avoid conflicts with traffic movements. Any necessary movement of employees or equipment onto or across the traffic lanes, the parking of equipment, or the storage of materials, should be done in accordance with the Manual on Uniform Traffic Control Devices.

11.3 WORKERS' APPAREL

11.3.1. GENERAL

Maintenance personnel should be dressed to perform their function adequately and safely and at the same time present a good image to the public. They should wear comfortable clothing which allows them to work freely and safely. Items of clothing that are most likely to become entangled in equipment should be avoided.

11.3.2. SAFETY CLOTHING

Certain items of safety clothing, such as special gloves, fluorescent vests, hard hats, goggles, etc., are provided by the Department. Employees usually furnish their work shoes, work gloves, and work clothes. The clothing and shoes worn by the employees should be sufficient to provide protection from both the work environment and the weather.

11.3.2.1 Eye Protection

Goggles or safety glasses are required whenever employees work where lying particles are most likely to be present. This work includes grinding, scraping, drilling, sandblasting, spraying chemicals, chain saw use and other similar activities.

When welding or using a cutting torch, employees must use properly fitted goggles or face shields. The lenses on the goggles or shield shall be tinted to the shade suitable for the work being accomplished.

11.3.2.2. Hand Protection

Gloves should be worn by employees who handle heavy or sharp objects. They should also wear appropriate gloves when working with hot asphalt, herbicides and other chemical sprays, as well as when handling or cutting containers of solid asphalt and traffic paint.

When welding or cutting with a torch, the worker should wear fire resistant or asbestos gloves. Rubber gloves should be worn under the welding gloves when an electric arc welder is used in wet or damp locations.

11.3.2.3. Other Protective Clothing

Maintenance activities requiring the wearing of hard hats is covered by Guide of Operations No. 1-5.

All flaggers should wear a highly visible orange vest, shirt or jacket to make them more visible to the motorists. Employees who work near traffic and who are not well protected should also wear highly visible clothing. This type of work includes litter pickup, hand mowing and other operations near the roadway.

Other maintenance operations may require special considerations for types of protective clothing.

11.4. OPERATION OF EQUIPMENT

The operation of equipment is a major responsibility of maintenance employees. The following general safety guidelines apply to the operation of all equipment:

1. Know the situation and the equipment.
2. Avoid potentially dangerous situations.
3. Let others know what to expect.
4. Do not try to exceed the equipment's capability.
5. Do not try to exceed your own capabilities.

The following sections present guidelines for the operation of equipment and also safety measures for operating the major types of maintenance equipment.

11.5. GUIDELINES FOR OPERATION OF EQUIPMENT

There are certain guidelines which should be followed in the operation of all Department equipment. Some of these are as follows:

1. There are no special privileges given to Department vehicles while traveling on public roads; therefore, the equipment operator should not expect any special

privileges.

2. Operators of Department equipment should be considerate and courteous to other operators of vehicles when traveling on public roads.
3. When entering and leaving work sites, equipment should, when practical, yield the right-of-way to traffic affected by the work.
4. Windows, especially windshield and rear windows, must be kept clean.
5. If there is poor rear visibility, the equipment should not be backed without a guide or "spotter" (a person who guides the operator from the ground).
6. Towed vehicles should not be backed up without a guide or spotter.
7. All work involving equipment should be done in a way which least affects traffic.
8. Only Department employees with the appropriate Commercial Driver's License (CLD) are allowed to operate equipment requiring a CDL.
9. Operators are responsible for checking the operating condition of equipment before starting to work.
10. Equipment should be parked as far off the roadway as possible when not in use in order to least affect traffic.
11. Equipment shall not be operated within six feet of overhead high voltage lines unless appropriate safeguards have been made. See Alabama Code Section 37-8-52 (1992 Repl. Vol.).

Chapter Twelve

HIGHWAY TRAFFIC ACCIDENTS

12.1. REPORTING ACCIDENTS

12.1.1. GENERAL

All motorists are required by law to report traffic accidents in which they are involved when there is a death, injury or property damage in excess of $250.00. All such accident reports are investigated and officially reported on the Alabama Uniform Traffic Accident Report form by a law enforcement officer. This law applies to all motorists on public roads including State employees driving State vehicles.

If a Transportation Department employee witnesses an accident, or encounters an accident that does not have a law enforcement officer present, the employee should notify the District office by radio or phone. If someone appears to be injured or if medical assistance is required, the Department employee should inform the district of this, as well as the exact location of the accident. The District office will contact the appropriate law enforcement agency and any other agencies required for additional services.

In the event of injured persons, Department employees must remember that if they provide first aid treatment and their actions later prove to have been harmful to the victim, they may be liable for their actions.

12.1.2. TRANSPORTATION DEPARTMENT ACCIDENTS

The District office should be notified as soon as possible when Department personnel or equipment are involved in any traffic accident with the public. The District office then calls The Department of Public Safety and requests emergency equipment and additional personnel as required. The investigating officer fills out the Alabama Uniform Traffic Accident Report and sends it to The Department of Public Safety in Montgomery. Since the accident involved State personnel or equipment, a copy of the report is also filed in the Division office.

See Section 2.10., Accidents and Injuries, of this manual for Department reports that must be submitted for accidents involving Department personnel or equipment.

12.2. ACCIDENT SITE CONTROL

It is the responsibility of the law enforcement officers to investigate traffic accidents and to direct traffic at accident sites. Major accidents occur which may block traffic for long periods of time and may cause damage to the structural elements of the highway. When these situations occur the State Trooper may request that the Transportation Department set up temporary warning signs and assist in providing temporary traffic control and flagging at the accident scene. Standard flagging procedures should be used as outlined in Part VI of the Manual on Uniform Traffic Control Devices.

Every district should have a set of emergency traffic control devices such as cones, flashing lights, barricades, flags and temporary warning signs reserved for traffic accidents and other emergencies. These devices should be stored in a central place in the district warehouse or yard so that they are readily available.

12.3 EMERGENCY MEDICAL SERVICES

12.3.1. GENERAL

Maintenance personnel are more likely to encounter or be involved in traffic accidents since they work on the highways daily. Therefore, they should know what procedures to follow and whom to notify in the event that medical assistance and life-saving techniques are required.

Maintenance personnel should do nothing if they are unsure of the victim's condition or if they do not know what to do about the condition. However, all maintenance personnel must know how to notify the District office in the event of an emergency. When ambulance services are required, the District office or the law enforcement officer at the accident scene will contact the nearest facility.

12.3.2. FIRST-AID TREATMENT

Maintenance personnel should not apply first aid to injured accident victims except when such action is required to save the victim's life. A person's life may be in danger when one or more of the following conditions exist. Standard first-aid treatments are identified for these more common conditions.

12.3.2.1. Shock

A victim in shock has cold, clammy skin, pale complexion and glassy eyes. The victim may be either conscious or unconscious. Keep the victim warm and raise the legs to get blood flowing to the brain. If the victim's legs or back appear to be broken, the victim should not be moved.

12.3.2.2. Contact with a Live Electrical Wire

Do not touch a person who is in contact with a live electrical wire. Use rubber gloves, insulated pliers, a dry towel or coat, a dry stick or any other insulators around to separate the wire from the victim. After removing the electrical danger, treat the victim for shock and use artificial respiration if necessary.

12.3.2.3. Blood Spurting from a Wound

Spurting blood usually indicates that an artery has been cut. If the bleeding is not stopped, the victim may bleed to death. The simplest way to stop the bleeding is by applying direct pressure on the wound with a clean cloth. If the wound is on an arm or a leg, use a cloth or other material as a tourniquet around the limb to stop the flow of blood. Special care must be exercised when dealing with emergencies involving open bleeding to avoid direct contact with a victim's blood.

12.3.3 OTHER EMERGENCY MEDICAL PROCEDURES

Only persons trained in first-aid procedures should attempt to provide treatment. It is better to do nothing than to do something that may prove harmful. Never give an injured person any liquids or medicines. The victim should not be moved unless the victim's life is in danger from fire, explosions, vehicular traffic, or other hazardous accident site conditions. Any

necessary movement must be done carefully and limited to what is necessary to save the victim's life or to prevent further injury.

12.4. REMOVAL OF DAMAGED VEHICLES

The removal of damaged vehicles from an accident site is normally performed by private wreckers. The owners of the vehicles involved may select the towing company of their choice, or the law enforcement officer investigating the accident will summon a wrecker to remove the damaged vehicles.

The Department has its own wreckers and tow trucks, but they are normally used only for State vehicles. Occasionally it may be necessary for a Department wrecker to tow vehicles to the shoulder of the road in order to restore the flow of vehicular traffic.

If an accident occurs which blocks traffic, nothing should be moved until a law enforcement officer arrives, unless first aid or medical attention requires that something be moved or disturbed.

Additional information on the removal of damaged vehicles and debris from accident sites can be found in Chapter Thirteen, Section 13.4.1., of this manual.

12.5. DAMAGED STATE PROPERTY

State property includes highways, bridges, other structures, buildings, vehicles, equipment, materials, real estate including the right-of-way and all other property owned by the State of Alabama.

When damage is inflicted on State property, the State tries to recover damages when the party or parties responsible for the damage can be identified. There are four major types of damage to State property. These are:

1. Vandalism.
2. Reported Traffic Accidents.
3. Unreported Traffic Accidents.
4. Accidents by State Vehicles.

Damages resulting from vandalism are extremely difficult to recover, unless someone observes the incident and reports the identity of the individuals involved.

Traffic accident reports identify any damage to the highway facility or other State property. Therefore, when damage to highway structures and other State property is observed, the Department should call the law enforcement agency in that jurisdiction and ask if any accidents have been reported lately at the site of the damage. If so, the Department should obtain copies of the reports. These should be submitted to the Department's Legal Bureau for recovery of damages.

A computer generated report entitled "Accidents Involving State Routes and Interstate Routes" is sent to each Division office monthly. This report should be used by Division and District personnel to identify damaged State property.

Damages resulting from unreported traffic accidents are more difficult to recover. As with vandalism, unless someone observed the incident and identified the responsible party, these types of damages can rarely be recovered.

For damage involving State vehicles the procedure for recovery of damages is easier. When a State vehicle is involved in a traffic accident, the Department should obtain and submit a copy of the accident report for review and processing by the Legal Bureau of the Department.

If the vehicle or equipment is damaged on the job or if the traffic accident is judged to be the fault of a Department employee, that employee may be held financially liable for the damages. Each such case is judged on an individual basis and the opinion of the employee's immediate supervisor usually is the controlling factor.

Every State vehicle should be equipped with instructions on what to do in the event of an accident. These instructions, normally found in the glove compartment, give all the information usually needed. If a State vehicle is involved in a traffic accident, a law enforcement officer must be called. The employee involved must also report the accident to his immediate supervisor.

Employees should refer to Chapter Thirteen of the Equipment Manual for detailed information on parties which must be notified and documents to be expeditiously completed following an accident involving a Department vehicle.

Chapter Thirteen

DEBRIS CONTROL

13.1. TYPES OF DEBRIS

There are two basic types of debris found on highways, roads, and streets - hazardous and non-hazardous. The first type can be dangerous and can present a hazard to the motorist or adjacent communities when left on the highway facilities. Hazardous debris includes, but is not limited to, the following:

1. Vehicles and other highway debris resulting from motor vehicle crashes.

2. Spilled cargoes of fuels, flammable liquids, dangerous chemicals, toxic or poisonous materials, explosives, radioactive materials, etc.

3. Other material spillage such as sand, gravel, concrete, lumber, building materials and other dry bulk materials.

4. Rock slides, mud slides, trees, and tree limbs.

5. Electrical wires and other utility lines.

6. Live or injured animals within the right-of-way limits.

7. Large dead animals on the roadway surface.

8. Damaged signs, guardrail sections or other

roadway elements obstructing the traveled way.

9. Disabled or abandoned vehicles on the roadway surface or shoulders.

The second type of debris is commonly called litter and is primarily a nuisance. It is unsightly and detracts from the appearance of the roadway but its presence does not normally constitute a danger. This type of debris, or litter, is removed by spot litter pickup and full width litter pickups periodically as maintenance crews are available.

13.2. DETECTION

Maintenance personnel should always be alert for hazardous debris and litter on the roadway surface while traveling to and from work sites. Hazardous debris, when observed or notified of such, should be removed or reported as outlined under Section 13.3. Litter and other minor debris, including small dead animals, should be removed as soon as practical after they are observed.

Reports by private citizens and others should be responded to by maintenance personnel or referred to other appropriate agencies. Refer to Chapter Three for further information on incident reporting. The situation should be assessed regarding potential danger, scope of problem, and the type of assistance required to deal with the debris.

13.3. REPORTING

Maintenance personnel should report as soon as practical by radio or telephone to their district office after detecting a hazardous site and assessing the potential danger. The report to the district should indicate:

+ location of the incident,
+ nature of the incident,
+ need for law enforcement officer,
+ need for ambulance service,

+ need for fire fighting equipment,
+ need for tow truck, and
+ need for other special assistance.

The district office should call the State Trooper or city police and other services as required. The district office should provide details of the report to the appropriate law enforcement agency. Any necessary special experts will be contacted by the law enforcement agency for instructions in handling the situation until assistance arrives on the scene.

13.4. RESPONSIBILITY

The primary responsibility for hazardous debris control and removal is with the Emergency Management Agency with coordinated effort from the Department of Public Safety and the Department of Environmental Management.

In the absence of a local law enforcement response to any such leak, spill, or accident of this type, or when requested to act by local authorities, the Department of Public Safety shall be the agency to coordinate and control all direct operations on the scene of a leak, spill, or accident regarding hazardous material relating to fighting or controlling the discharge or release of hazardous materials, chemicals, or other substances and protecting the lives and health of all individuals who might be placed in danger as a result of such leak, spill, or accident.

EXECUTIVE ORDER NUMBER 40 dated July 23, 1985, requires that every department and agency of State government that has a response capability cooperate with the Emergency Management Agency, the Department of Public Safety, and the Department of Environmental Management in the establishment of a coordinated and unified system that will assure the citizens of Alabama have the best protection available from hazardous materials, spills, leaks, and releases.

13.4.1. DEBRIS FROM VEHICLE ACCIDENTS

Hazardous debris and damaged vehicles due to motor vehicle accidents are the responsibility of the owner, State Troopers, and the wrecker services. Alabama State Law specifies that the wrecker service may not leave the accident scene until the roadway is clear of all debris. In cases where neither the wrecker service nor the State Troopers are equipped to remove specific types of debris, maintenance personnel may assist in debris removal.

13.4.2. ABANDONED MOTOR VEHICLES

Responsibility for the removal of abandoned motor vehicles is assigned to the State Troopers. State law prohibits the removal of abandoned vehicles for a period of seven days - unless they are definite traffic hazards. Following the seven-day period, the State Troopers should contact a wrecker service to remove the motor vehicle.

13.4.3. CARGO AND MATERIAL SPILLAGE

Cargo spillage and other materials falling from vehicles on the roadway are to be removed by the owners of the materials and at their own expense. Every attempt should be made to contact the owner when cargoes or materials are abandoned. The Department of Transportation has a responsibility to remove these materials from the traveled way when the owners do not remove them (except hazardous materials covered in 13.6).

13.4.4. ANIMALS OR LIVESTOCK

The owners of the livestock or farm animals have the primary responsibility for the removal of these animals from within the right-of-way limits. State Troopers are responsible for clearing live animals from the right-of-way when the owners cannot be contacted. The removal and disposal of unclaimed dead animals are to be performed by maintenance personnel.

3.4.5. ROCK SLIDES, TREES, AND OTHER DEBRIS

Maintenance personnel are responsible for the removal of rock slides, trees, and other types of debris, due to natural disasters, from the roadway and right-of-way.

13.5. TRAFFIC CONTROL

Normally, traffic control will be under the supervision of State Troopers or city policemen. Maintenance personnel should cooperate with police and provide assistance as requested. The following procedures may be used by maintenance personnel, as appropriate, to prevent additional accidents and restore safe traffic movements:

1. The site should be isolated from sightseers to (1) prevent secondary accidents; (2) provide room for the arrival and departure of emergency vehicles; (3) provide working space for necessary restoration operations; and (4) protect evidence useful for completing necessary investigations.

2. Approaching vehicles should be warned through the use of cones, barricades, flasher units, flares, signs, or other warning devices when feasible.

3. Flaggers should be used when necessary to stop or slow traffic before routing through the site.

4. When it is not possible to route traffic through the location, the route should be closed and a detour route established and marked.

These procedures may be used by maintenance personnel, or as directed by the investigating officer.

13.6. HAZARD CONTROL & ENVIRONMENTAL EMERGENCIES

The responsibility for controlling or neutralizing hazardous debris is covered in 13.4. Maintenance personnel are not equipped to handle the various types of hazardous debris which may be encountered on the highway. The following comments are for general guidance in the event that a maintenance employee should find it necessary to provide assistance in debris control.

13.6.1. IDENTIFICATION OF HAZARDOUS MATERIALS

Hazardous materials being toxic, flammable, explosive, or corrosive by composition or application can be identified from one or more of the following sources:

1. Placards placed on the vehicle denoting the character of the cargo (flammable, explosive, etc.) are useful in establishing the greatest danger from the materials.

2. Cargo manifests identify contents by name and can be used to determine hazards if a placard is not displayed.

3. Color-codes used on manifest and on containers holding hazardous substances can offer further assistance in identifying which of a mixed load are the most dangerous.

4. CHEMTREC (Chemical Transportation Emergency Center) may be called for immediate advice at the scene of emergencies, and prompt contact of the shipper of the chemicals involved for more detailed assistance and appropriate follow-up.
   Call toll-free number: 1-800-424-9300.

13.6.2. HANDLING HAZARDOUS MATERIALS

Details for Department of Transportation personnel involved in hazardous material incidents are found in the current issue of the **EMERGENCY RESPONSE GUIDEBOOK** published by the U.S. Department of Transportation.

Hazardous material incidents are coordinated and investigated by the Department of Public Safety, unless the accident occurs in a city or town, then local authorities assume control. These incidents should be reported to them as soon as practical. These incidents should also be reported to the Maintenance Bureau as soon as practical.

The shipper is responsible for cleanup of hazardous material incidents. Maintenance personnel may be requested to assist in non-toxic clean-up operations.

13.7. RESTORING TRAFFIC SERVICE

Seldom does a site require additional work after cleanup operations. However, any roadway features that have been damaged should be repaired as soon as practical. Typical items that may require repair include pavement, bridge railings, signs, sign posts and supports, guardrails, lane markings and other related structures.

TABLE 5-1
MAINTENANCE WORK ACTIVITIES AND WORK MEASUREMENT UNITS

	WORK ACTIVITY	WORK MEASUREMENT UNIT
Roadway and Shoulder Maintenance		
601	Spot Premix Patching	Tons of Premix
602	Major Premix Patching	Tons of Premix
603	Skin Patching	Liters of Asphalt
604	Strip Patching	Liters of Asphalt
605	Joint Filling	Kilograms of Filler
606	Blading Unpaved Roads	Road Kilometers
607	Pavement Planing	Square Meters
608	Blading Unpaved Shoulders	Shoulder Kilometers
609	Spot Patching Unpaved Shoulders	Cubic Meters Material
610	Clipping Unpaved Shoulders	Shoulder Kilometers
614	Other Roadway and Shoulder Maintenance	Man Hours
Drainage Maintenance		
615	Patrol Ditching	Ditch Kilometers
616	Shovel Ditching	Lineal Meters of Ditch
617	Cleaning Minor Drainage Structures	Structures Cleaned
618	Repairing Minor Drainage Structures	Man Hours
624	Other Drainage Maintenance	Man Hours
Roadside Maintenance		
625	Mowing	Hectares
626	Herbicide Treatment	Liters of Mixture
627	Brush and Tree Cutting	Man Hours
628	Erosion Control	Man Hours
629	Spot Litter Pickup	Man Hours
630	Full Width Litter Pickup	Pass Kilometers
634	Other Roadside Maintenance	Man Hours
Traffic Operations Maintenance		
635	Sign Maintenance	Man Hours
636	Centerline and Edgeline Painting	Pass Miles
637	Pavement Message Painting	Man Hours
638	Guardrail Maintenance	Lineal Meters
639	Traffic Signal/Street Light Maintenance	Man Hours
644	Other Traffic Operations	Man Hours
Structure Maintenance		
645	Bridge Cleaning	Man Hours
646	Bridge Painting	Liters of Paint
647	Minor Repairs on Bridges	Man Hours
648	Major Repairs on Bridges	Man Hours
649	Moveable Span Maintenance	Man Hours
650	Tunnel Maintenance	Man Hours
654	Other Structure Maintenance	Man Hours

TABLE 5-1 (continued)
MAINTENANCE WORK ACTIVITIES AND WORK MEASUREMENT UNITS

	WORK ACTIVITY	WORK MEASUREMENT UNIT
Minor Maintenance Improvements		
656	Other Roadway/Shoulder Improvements	Man Hours
657	Roadside Improvements	Man Hours
658	Drainage Improvements	Man Hours
659	Traffic Operations Improvements	Man Hours
664	Other Improvements	Man Hours
Winter and Emergency Maintenance		
665	Snow and Ice Control	Man Hours
666	Emergency Maintenance	Man Hours
667	Road Patrol	Man Hours

REFERENCE MATERIALS

REFERENCE MANUALS

1. Aids to Navigation, Coast Guard Pamphlet – CG 204.

2. Manual on Uniform Traffic Control Devices, U. S. Department of Transportation, Federal Highway Administration.

3. A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials.

4. Bridge Inspector's Training Manual, U. S. department of Transportation, Federal Highway Administration.

5. Construction Manual, Bureau of Construction, State of Alabama Department of Transportation.

6. Field Operations manual, Bureau of Maintenance, State of Alabama Department of Transportation.

7. Highway Laws of Alabama, Latest Reprint from Code of Alabama, Legal Division, State of Alabama Department of Transportation.

8. Testing Manual, Bureau of Materials and Test, State of Alabama Department of Transportation.

9. Laws, Rules, and Regulations Relating to Operation and Licensing of Junkyards, State of Alabama Department of Transportation.

10. Management System Procedures, Bureau of Maintenance, State of Alabama Department of Transportation.

11 Manual for Maintenance Inspection of Bridges, American Association of State Highway and Transportation Officials.

12. Manual of Standard Policies, Procedures, and Instructions, (All volumes plus changes), Bureau of Accounting, State of Alabama Department of Transportation.

13. Rules of the State Personnel Board, State of Alabama Personnel Department.

14. Rules and Regulations for Small Passenger Vessels, Coast Guard Pamphlet – CG 323.

15. Utility Manual, Bureau of Design, State of Alabama Department of Transportation.

16. Standard Specifications for Highway Construction, Bureau of Construction, State of Alabama Department of Transportation.

17. Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, U. S. Department of Transportation, Federal Highway Administration.

18. Bridge Inspection Manual, Bureau of Maintenance, State of Alabama Department of Transportation.

19. Materials, Sources, and Devices with Special Acceptance Requirements, Bureau of Research and Development, State of Alabama Department of Transportation.

20. Guidelines of Operation, State of Alabama Department of Transportation.

21. Equipment Manual, Bureau of Equipment, State of Alabama Department of Transportation.

22. A Manual for Roadside Vegetation Management, Bureau of Maintenance, State of Alabama Department of Transportation.

23. A Guide for Erecting Mailboxes on Highways, American Association of State Highway and Transportation Officials.

DEFINITIONS OF TERMS

ABIMS	Alabama Bridge Information Management System.
Access Control (full)	Access to a highway is limited to selected public roads only. No crossings at grade or driveways are permitted.
Access Control (partial)	In addition to the access connection at selected public roads, there may be some crossings at grade and some driveway connections.
Additive	A substance or agent added in small amounts to a basic ingredient of a mixture prior to mixing.
Admixture	A substance or agent added in small amounts to the basic ingredients of a mixture during the mixing process.
Aggregate	A mixture of mineral fragments usually obtained by crushing limestone, granite or slag.
Aggregate (coarse)	A mixture of hard, strong durable pieces of crushed or uncrushed gravel, crushed stone or crushed slag.
Aggregate (dense-graded)	A well-graded aggregate so proportioned as to contain a relatively small percentage of voids.
Aggregate (fine)	A mixture of hard, clean, durable and uncoated particles of natural or manufactured sand.
Aggregate (natural)	Gravel or sand that is found in natural deposits and requires no additional crushing. The only processing of natural materials includes washing and screening to obtain the desired gradation.
Aggregate (open-graded)	A well-graded aggregate, containing little or no fines, with a relatively large percentage of voids.
Aggregate (polished)	Aggregate that has a low coefficient of friction as a result of traffic action or natural causes.
Aggregate (gap-graded)	Aggregate possessing disproportionate distribution of successive particle sizes.
Aggregate (well-graded)	Aggregate possessing proportionate distribution of successive particle sizes.
Arterial Highway	A highway primarily for through traffic, usually on a continuous route.

Asphalt	A dark brown to black solid, semisolid or liquid material obtained as residue from refining petroleum.
Asphalt Cement	Asphalt that is refined to meet specifications for paving, industrial and special purposes.
Asphalt Emulsions	A combination of asphalt cement, water and an emulsifying agent. When an emulsion sets up, the water evaporates or drains away leaving the asphalt. The time required for the material to set up is governed by the proportions, the types of the components in the emulsion, temperature and humidity. The asphalt emulsions are designated as rapid setting (RS), medium setting (MS) or slow setting (SS).
Asphalt, Medium Curing (MC)	Asphalt cement that is cut back with a kerosene type material that evaporates slowly when exposed to air and to heat. The presence of the kerosene makes the asphalt workable at relatively low temperatures.
Asphalt, Rapid Curing (RC)	Asphalt that is cut back with a naphtha or gasoline-type distillate that evaporates more rapidly than kerosene.
Asphalt, Slow Curing (SC)	A blend of asphalt cement and residual oil with little or no volatile portions to evaporate.
At-Grade Intersection	An intersection where all roadways join or cross at the same level.
Auxiliary Lane	The portion of the roadway adjoining the traveled way for parking, speed change, or for other purposes supplementary to through traffic movement.
Average Daily Traffic ADT	The average 24-hour traffic volume on a roadway segment.
Backfill	Material used to replace or the act of replacing material removed during the construction or maintenance; also may denote material placed or the act of placing material adjacent to structures.á
Base Course	The layer or layers of specified or selected material placed on a subbase or a subgrade to support a surface course.

Betterment	Improvements, adjustments or additions to a highway which more than restore it to its former good condition and which result in better traffic serviceability without major changes in its original construction.
Bifurcated Highway	Divided highway with two separate roadways with distinct horizontal and vertical alignments and variable median widths.
Binder Course	An intermediate course between a base course and an asphalt surface course.
Bituminous Concrete	The wearing course of a bituminous pavement Pavement structure. The bituminous concrete is a hot plant mixture consisting of a mixture of asphalt cement and well-graded, high quality aggregate, thoroughly compacted into a uniform dense mass.
Bituminous Plant Mix (Cold)	A bituminous concrete mixture with liquifier types of bituminous material to enable mixing, spreading and compacting at atmospheric temperatures.
Bituminous Plant Mix (Hot)	Bituminous concrete mixture of hot asphalt and hot aggregate. This heated condition must be maintained during the transporting, spreading and compacting processes.
Bituminous Treatments	Applications of asphaltic or bituminous materials to any type of road or pavement surface, with or without a cover of mineral aggregate, which produce less than one inch increase in surface thickness. Also, may be called surface treatment.
Bleeding	Free bitumen on the surface of the pavement.
Blow-up (buckling)	Upward bulging and crumbling of a PCC slab, usually at a transverse crack or joint.
Blow-up (shattering)	Shattering of PCC slab, usually at a transverse crack or joint.
Borrow	Suitable material from sources outside the right-of-way, used primarily for embankments.
Bridge Culvert	A box culvert at least 20 feet in width measured along the centerline of the road under which it passes.
Channelized Intersection	An at-grade intersection in which is directed into definite paths by pavement markers and islands.
Clear Roadside Area	An unencumbered, obstructed, relatively flat area beyond the edge of the traveled way for the recovery of errant vehicles. The width of this area varies, but is usually 30 feet or more depending on the characteristics of the roadway section and whether or not guardrails and other similar vehicle restraining facilities are employed. Refer to specific AASHTO design guides for appropriate definitions.

Cloverleaf	A four-leg interchange with loops for left turns and outer connections for right turns. A full cloverleaf has two turning movements in each quadrant.
Construction Joint	A joint due to a prolonged interruption in the placing of portland cement concrete or a designed separation of the construction material.
Contraction Joint	A joint at the end of a rigid slab to control the location of transverse cracks.
Corrugations	Washboard-like waves in the pavement consisting of alternate crests and valleys less than two feet apart.
CPMS	A Comprehensive Project Management System is under development as this Manual is being published. See PMS.
Cracking (alligator)	Interconnected or interlaced cracks resembling the lines on an alligator's hide. Also called pattern cracks or map cracks.
Cracking (contraction)	Horizontal separation of a pavement overlay.
Cracking (corner)	A break in a PCC pavement at the corner of the slab near the juncture of the transverse joint and longitudinal joint or slab edge.
Cracking (diagonal)	Similar to corner crack except that the fracture extends diagonally across the end of the slab.
Cracking (edge)	Longitudinal cracking near the edge of the pavement.
Cracking (longitudinal)	A crack or break approximately parallel to the pavement centerline.
Cracking (random)	Unrestrained, or uncontrolled, irregular break or separation of the pavement.
Cracking (reflection)	A crack appearing in a resurface or overlay caused by movement at joints or cracks in underlying base or surface.
Cracking (slippage)	Half-moon or crescent-shaped cracks in the direction of traffic.
Cracking (transverse)	A crack approximately at right angles to the pavement centerline.
Culvert	A pipe or rectangular concrete horizontal passageway for drainage of water.
Depression	Localized pavement areas at an elevation lower than that of the adjacent paved areas or of the design elevation.
Diamond Interchange	A four-leg interchange with a single one-way ramp in each quadrant. Left turns are made directly on the minor highway.
Distortion	Any deviation in the pavement surface from the original shape.
Drainage	Controlled flow of water from and through the roadway by means of well-designed drainage structures.

Drainage Easement	An easement acquired for the construction or maintenance of drainage ditches and structures.
Easement	A right acquired usually by public authority to use or control property for a designated purpose.
Embankment	A structure of soil, soil aggregate or broken rock between the embankment foundation and the subgrade.
Erosion	Disintegration or wearing away, especially as a result of wind, rain and natural elements.
Expansion Joint	A joint located to provide for expansion of a PCC slab, without damage to itself, adjacent slabs or structures.
Failure	Unsatisfactory performance of a pavement or portion thereof such that it can no longer serve its intended purpose.
Faulting	Differential vertical displacement of abutting PCC slabs at joints or cracks creating a "step" deformation in the pavement surface.
Fog Seal	A thin application of liquid asphalt without cover aggregate.
Friction Number	The numerical rating of a section of pavement which indicates the capability of the pavement surface to resist skidding. The number is a multiple (100 times) of the coefficient of friction as obtained from a standard test. Higher or increasing numbers indicate better or increased "skid" resistance.
Gore Area	A triangular piece of land between the traveled way and a ramp branching off from the road.
Grade Separation	A crossing of two highways or a highway and a railroad at different levels.
Interchange	A grade separated intersection with one or more turning roadways for travel between intersection legs.
Joint	A designed vertical plane of separation or weakness.
Joint Failure	Broken, crushed or displaced slab edges.
Joint Filler Extrusion	Joint filler protruding above joint edges.
Joint Stripping	Joint filler coming out of the joint.
Kilometer Post	A signpost showing the distance in kilometers from the western end of west-to-east routes or from the southern end of south-to-north routes.
Left Turn Bay	An auxiliary lane cut from the median and serving to contain a designed number of vehicles waiting to make a left turn. Also, may be called a stacking lane.

Leveling Course	The layer of material placed on an existing surface to eliminate irregularities prior to placing an overlaying course.
Longitudinal Joint	A joint normally placed between traffic lanes to control longitudinal cracking.
Median	The portion of a divided highway separating the traveled ways of opposing traffic.
Metric	Refers, generally, to the International System of Units (SI) and specifically as defined in ASTM E 380.
MMS	Maintenance Management System.
Median Crossover	A gap in the median provided for crossing and turning traffic.
Parking Lane	An auxiliary lane primarily for the parking of vehicles.
Pavement (flexible)	A pavement structure which maintains intimate contact with and distributes loads to the subgrade and depends upon aggregate interlock, particle friction and cohesion for stability.
Pavement (rigid)	A pavement structure which distributes loads to the subgrade having as one course a portland cement concrete slab of relatively high bending resistance.
Pavement Structure	The combination of subbase, base course and surface course placed on a subgrade to support the traffic load and distribute it to the roadbed.
PMS	Project Management System (see CPMS).
Portland Cement Concrete (PCC)	Basic mixture of sand, aggregate, water and portland cement.
Pothole	Rough, irregular-shaped holes of various sizes in the pavement.
Prime Coat	An application of a low viscosity liquid asphalt material to coat and bind material particles preparatory to placing a base or surface course.
Profile	The line of intersection of a vertical plane and the surface of the pavement; the outline or silhouette of the pavement surface.
Pumping	The ejection of foundation material, either wet or dry, through joints, cracks or along edges of rigid slabs due to vertical movement of the slab under traffic.
Raveling	The progressive disintegration from the surface downward by the dislodgement of aggregate particles.
Resurfacing (liquid seal)	One or more applications of liquid asphalt material and cover aggregate on an existing surface.
Resurfacing (plant mix)	The placing of one or more new courses of bituminous concrete on an existing surface.

Right-of-Way	A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to a highway.
Roadbed	The graded portion of a highway within top and side slopes prepared as a foundation for the pavement structure and shoulder.
Roadside	The area between the traveled way and the right-of-way lines. On a divided highway, the median is also considered part of the roadside.
Roadway	The portion of a highway, including shoulders, for vehicular use.
Roughness	Irregularities in the pavement surface that adversely affect riding quality of the vehicle.
Routine Maintenance	Restoration and repair of the roadway and roadside to a reasonably safe and usable condition.
Rutting	Depressions in the pavement surface along the wheel paths of traffic.
Scaling	Progressive disintegration and loss of concrete wearing surface.
Seal Coat	A thin treatment consisting of liquid asphalt material and cover aggregate applied to a surface course. Also, may be called liquid seal coat.
Serviceability	Ability of a pavement to serve traffic with comfort and with a minimum of detrimental effects to either vehicle or pavement.
Service Life	A period of time over which a pavement performs its designed purpose.
Shoulder	The portion of the roadway touching the traveled way for accommodation of stopped vehicles for emergency use and for lateral support of base and surface courses.
Shoving	Displacement or bulging of paving material in the direction of loading or pressure.
Sight Distance	The distance in the direction of travel that the highway, signs, signals and opposing traffic are visible.
Sight Line Easement	An easement for maintaining or improving the sight distance.
Slurry Seal	A seal coat consisting of a semi-fluid mixture of asphalt emulsion and fine aggregate.
Spalling	Breakdown or disintegration of slab edges at joints or cracks or directly over reinforcing steel, usually resulting in removal of sound concrete.
Speed Change Lane	An auxiliary lane, including tapered areas, primarily for the acceleration and deceleration of vehicles entering or leaving the through traffic lanes.
Stabilization	Modification of soils or aggregates by incorporating materials that will increase load bearing capacity, firmness and resistance to weathering or displacement.

Streaking	Alternate lean and heavy lines of bitumen running parallel to the pavement centerline.
Stripping	Separation of bituminous films from aggregate particles in the presence of moisture.
Stubout	A short area of widening of the roadway pavement to accommodate a side road, a turnout, a roadside litter barrel or a group of mailboxes.
Subbase	The layer or layers of specified or selected material of designed thickness placed on a subgrade to support a base course.
Subgrade	The top surface of a roadbed upon which the pavement structure and shoulders are constructed.
Surface Course	The top layer of a pavement structure which resists skidding, traffic abrasion and the disintegrating effects of climate. This top layer is sometimes called the wearing course.
Surface Treatment	Application of asphaltic or bituminous materials to any type of road or pavement surface, with or without a cover of mineral aggregate, which produce less than one inch increase in surface thickness. Also, may be called bituminous treatment.
Tack Coat	An application of liquid asphalt material to an existing surface to provide bond with a course to be added on top of it.
Texture	The appearance or character of the surface of a pavement that depends on the size, shape, arrangement and distribution of the aggregates and cement or binder.
Traffic Control Device	Any sign, signal, marking or installation placed or erected under public authority for the purpose of regulating, warning or guiding traffic.
Traffic Lane	The portion of the traveled way for the movement of a single line of vehicles.
Traveled Way	The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.
Truck Climbing Lane	An auxiliary lane on a hill designed to carry slow moving heavy vehicles up the hill.
Upheaval	Localized upward displacement or uplifting of the pavement caused by swelling of high clay content base, sub-base or roadbed materials due to the absorption of moisture. Also may be caused by the bulging of a soft pavement from shoving.
Waves	Longitudinal or transverse undulations in the surface of the pavement consisting of alternate valleys and crests approximately two feet or more apart.
Weathering	Gradual disintegration of the pavement wearing surface, increasing the texture and exposing more and more of the aggregates.

Wearing Course	The top layer of a pavement structure which resists skidding, traffic abrasion and the disintegrating effects of climate. This top layer is sometimes called the surface course.