

CHAPTER 1

PLANNING

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CHAPTER 1

PLANNING

A INTRODUCTION

Planning, as discussed in this section, is not to be confused with the broader transportation system's planning and project programming which normally precedes the design, construction, and maintenance of highways.

Developing and maintaining an efficient highway system requires careful planning by each unit in a highway agency. This includes both planning for the design and construction of streets and highways and planning for operating the facilities. Overall planning would include a consideration for all aspects of design, construction, and operations (including maintenance) affecting the resulting characteristics of streets and highways. These characteristics will be significantly affected by the degree to which the various demands and requirements on the highway system are satisfied in the initial planning and design.

Successful highway design requires that the role of each new facility in the overall highway system be clearly delineated. The determination and clear definition of the function and classification of each street and highway is also required. Safety and efficiency of new facilities is predicated, to a large extent, on corridor selection and provisions for adequate right of way, alignment, and access control. Initial planning and design should also consider provisions for future modifications and upgrading required by changes in speed, volume, or standards.

Plans for actually operating a new street or highway should be considered in the initial planning and should be closely coordinated with the design of the facility. Development of plans and procedures for successfully operating an existing highway system must include a consideration of all activities affecting the operating characteristics of each street and highway.

Planning, designing, operating, and maintaining a highway system has become more complex in recent years. These disciplines must now address the needs of increased public transit and pedestrian traffic, increasing bicyclist use, the growing number of elder road users, and the mobility needs of the disabled. This begins in planning and continues throughout the design and operational process.

B CONFLICTING CRITERIA

Development of safe streets and highways for all modes of surface transportation (autos, trucks, bicycles, pedestrians, transit vehicles, etc.) should receive the highest priority in the design process. This objective may tend to be compromised by other conflicting requirements and demands upon the highway system. The following criteria should be considered and resolved in the initial planning and design of streets and highways to avoid a sacrifice of required safety characteristics.

B.1 Economic Constraints

In determining the benefit/cost ratio for any proposed facility, the economic evaluation should go beyond the actual expenditure of highway funds and the capacity and efficiency of the facility. Overall costs and benefits of various alternatives should include an evaluation of the probable environmental, community, and social impact and their effect upon highway quality and cost.

Allocation of sufficient funds for obtaining the proper corridor and adequate right of way and alignment should receive the initial priority. Future acquisition of additional right of way and major changes in alignment are often economically prohibitive. This can result in substandard streets and highways with permanent hazards. Reconstruction or modification under traffic is expensive, inconvenient, and hazardous to the highway user. This increase in costs, hazards, and inconvenience can be limited by initial development of quality facilities.

B.2 Access

Demand for access to streets and highways by adjacent property owners can produce problems. Although the public must have reasonable access to the highway network, it is necessary to have certain controls and restrictions. Allowing indiscriminate access can seriously compromise the safety capacity and level of service of a street or highway, consequently reducing its utility and general economic value.

The proper layout of the highway network and the utilization of effective land use controls (CHAPTER 2 - LAND DEVELOPMENT) can provide the basis for regulating access. The actual access controls should conform to the guidelines given in CHAPTER 3 - GEOMETRIC DESIGN.

B.3 Maintenance Capabilities

Planning and design of streets and highways should include provisions for the performance of required maintenance. The planning of the expected maintenance program should be coordinated with the initial highway design to ensure maintenance activities may be conducted without excessive traffic conflicts or hazards.

B.4 Utility and Transit Operations

Utility accommodation within rights of way is generally considered to be in the public's best interest, since rights of way frequently offer the most practical engineering, construction, and maintenance solutions for utility service to businesses and residences. Utility and transit facility locations should be carefully chosen to minimize interference with the operations and safety of the transportation facility.

B.5 Emergency Response for Fire, Police, etc.

Development of an effective emergency response program is dependent upon the nature of the highway network and the effectiveness of the operation of the system. Provisions for emergency access and communication should be considered in the initial planning and design of all streets and highways. Local emergency response personnel should be included in primary activities.

B.6 Environmental Impact

Construction and operation of streets and highways frequently produces an adverse effect upon the environment. Early consideration and solution of environmental problems can avoid costly delays and modifications that may compromise the quality and efficiency of operation. Specific problems often encountered include the following:

- Noise pollution
- Air and water pollution
- Interruption of the hydrological system
- Degradation of the biological system

B.7 Community and Social Impact

Quality and value of a community is directly influenced by the layout and design of streets and highways. Quality of the network determines the freedom and efficiency of movement. Inadequate design of the network and poor land use practices can lead to undesirable community separation and deterioration. Specific design of streets and highways has a large effect upon the overall aesthetic value which is important to the motorist and resident.

Conflicting criteria should be resolved through early coordination. It is the responsibility of the planner and designer to consider, and where possible, select alternatives alleviating conflicts and promoting positive solutions to interrelated problems.

B.8 Modes of Transportation

Planning processes should analyze/evaluate other modes of transportation and their relationship to the highway system. Recommendations for incorporation into the design process should be made. This will involve coordination with local, city, county, special interest groups, etc., in developing such recommendations.

C HIGHWAY FUNCTION AND CLASSIFICATION

A determination of the function and operational requirements, and a clear definition of the classification of each new facility are required prior to the actual design.

C.1 Function

Design of each new street or highway is based upon its function in the highway system. Operational requirements that must be satisfied to fulfill this function are dependent upon the following factors:

C.1.a Volume

Volume of traffic that must be carried by the facility is a primary factor governing the design. Variations in volume with respect to direction and time should also be evaluated to determine the expected requirements for peak capacities.

C.1.b Highway User Types

Types and relative volumes of highway users expected to use the street or highway influence trip characteristics and design features.

C.1.c Trip Characteristics

Functions of a new facility are, to a large extent, determined by the length and purpose of vehicle trips. Trip characteristics are influenced by land use characteristics and the highway network layout.

C.1.d Speed

Operating speed (to be maintained) should meet reasonable expectations of the users.

C.1.e Safety

Provisions of streets and highways with safe operating characteristics shall be considered a primary requirement.

C.1.f Level of Service

Level of service is essentially a measure of the quality of the overall operating characteristics of a street or highway. Factors involved in determining the level of service include speed and safety, as well as travel time; traffic conflicts and interruptions; freedom to maneuver; driving convenience and comfort; and operating costs. Level of service is also dependent upon actual traffic volume and composition of traffic.

C.1.g Access Requirements

Degree and type of access permitted on a given facility is dependent upon its intended function and should conform to the guidelines in CHAPTER 3 - GEOMETRIC DESIGN. Reasonable access control must be exercised to allow a street or highway to fulfill its function.

C.1.h Public Transit Use

Both current and planned use by public transit influence design features. Transit vehicles increase capacity on a roadway. There must be the ability to safely stop along the roadway to board and discharge passengers.

C.2 Classification

Road classifications are defined in Section 334.03, Florida Statutes. Functional classification is the assignment of roads into systems according to the character of service they provide in relation to the total road network.

C.2.a Basic Classification

Basic functional categories include arterial, collector, and local roads which may be subdivided into principal, major, or minor levels. These levels may be additionally divided into rural and urban categories. This basic classification system is utilized throughout this Manual.

C.2.a.1 Local

A route providing service which is of relatively low average traffic volume, short average trip length or minimal through-traffic movements, and high land access for abutting property.

C.2.a.2 Collector

A route providing service which is of relatively moderate average traffic volume, moderately average trip length, and moderately average operating speed. These routes also collect and distribute traffic between local roads or arterial roads and serve as a linkage between land access and mobility needs.

C.2.a.3 Arterial

A route providing service which is relatively continuous and of relatively high traffic volume, long average trip length, generally higher operating speed, and high mobility importance. In addition, all United States numbered highways shall be arterial roads.

C.2.b Classification Modifications

Design and classification of streets and highways should also be based upon a consideration of highway user expectations. The function of any facility, as perceived by the user, essentially determines the driver's willingness to accept restrictions upon speed, capacity, access, or level of service. Basic classification systems may also be modified by the following variables:

C.2.b.1 Urban

Urban area highway users will generally accept lower speeds and levels of service. Economic constraints in urban areas are also generally more severe. Minor modifications in design criteria are, therefore, appropriate for urban streets.

C.2.b.2 Major/Minor

Streets and highways may be classified as major or minor depending upon traffic volume, trip length, and mobility.

D OPERATION

The concept of operating the existing highway network as a system is essential to promote safety, efficiency, mobility, and economy. This requires comprehensive planning and coordination of all activities on each street and highway. These activities would include maintenance, construction, utility operations, public transit operations, traffic control, and emergency response operations. Although the behavior of the individual motorist is somewhat independent, driver actions and response should also be considered as an integral part of the operation of streets and highways. Coordination of the planning and supervision of each activity on each facility is necessary to achieve safety and efficient operation of the total highway system.

D.1 Policy

Each highway agency with general responsibility for existing streets and highways should establish and maintain an operations department. Each existing street or highway should be assigned to the jurisdiction of the operations department. The operations department shall be responsible for planning, supervising, and coordinating all activities affecting the operating characteristics of the highway system under its jurisdiction.

D.2 Objectives

The primary objective of an operations department shall be to maintain or improve the operating characteristics of the highway system under its jurisdiction. These characteristics include safety, capacity, and level of service. The preservation of the function of each facility, which would include access control, is necessary to maintain these characteristics and the overall general value of a street or highway.

D.3 Activities

The achievement of these objectives requires the performance of a variety of coordinated activities by the operations department. The following activities should be considered as minimal for promoting the safe and efficient operation of a highway system.

D.3.a Maintenance and Reconstruction

Maintaining or upgrading the quality of existing facilities is an essential factor in preserving desirable operating characteristics. The planning and execution of maintenance and reconstruction activity on existing facilities must be closely coordinated with all other operational activities and, therefore, should be under the general supervision of the operations department.

All maintenance work should be conducted in accordance with the requirements of CHAPTER 10 - MAINTENANCE. The priorities and procedures utilized should be directed toward improvement of the existing system. The standards set forth in this Manual should be used as guidelines for establishing maintenance and reconstruction objectives. All maintenance and reconstruction projects should be planned to minimize traffic control conflicts and hazards.

D.3.b Work Zone Safety

An important responsibility of the operations department is the promotion of work zone safety on the existing highway system. The planning and execution of maintenance, construction, and other activities shall include provisions for the safety of motorists, bicyclists, pedestrians, and workers. All work shall be conducted in accordance with the requirements presented in CHAPTER 11 - WORK ZONE SAFETY.

D.3.c Traffic Control

Traffic engineering is a vital component of highway operations. The planning and design of traffic control devices should be carried out in conjunction with the overall design of the street or highway and highway user. The devices and procedures utilized for traffic control should be predicated upon developing uniformity throughout the system and compatibility with adjacent jurisdictions.

A primary objective to be followed in establishing traffic control procedures is the promotion of safe, orderly traffic flow. The cooperation of police agencies and coordination with local transit providers is essential for the achievement of this objective. Traffic control during maintenance,

construction, utility, or emergency response operations should receive special consideration.

D.3.d Emergency Response

The emergency response activities (i.e., emergency maintenance and traffic control) of the operations department should be closely coordinated with the work of police, fire, ambulance, medical, and other emergency response agencies. The provisions for emergency access and communications should be included in the initial planning for these activities.

D.3.e Coordination and Supervision

Coordination and supervision of activities on the highway system should include the following:

- Supervision and/or coordination of all activities of the operations department and other agencies to promote safe and efficient operation
- Coordination of all activities to provide consistency within a given jurisdiction
- Coordination with adjacent jurisdictions to develop compatible highway systems
- Coordination with other transportation modes to promote overall transportation efficiency

D.3.f Inspection and Evaluation

The actual operation of streets and highways provides valuable experience and information regarding the effectiveness of various activities. Each operations department should maintain a complete inventory of its highway system and continuously inspect and evaluate the priorities, procedures, and techniques utilized in all activities on the existing system under its jurisdiction. Activities by other agencies, as well as any highway agency, should be subjected to this supervision.

Promotion of highway safety should be aided by including a safety office (or officer) as an integral part of the operations department. Functions of this office would include the identification and inventory of hazardous locations and procedures for improving the safety characteristics of highway operations.

Results of this inspection and evaluation program should be utilized to make the modification necessary to promote safe and efficient operation. Feedback for modifying design criteria should be generated by this program. Experience and data obtained from operating the system should be utilized as a basis for recommending regulatory changes. Cooperation of legislative, law enforcement, and regulatory agencies is essential to develop the regulation of vehicles, driver behavior, utility, emergency response activities, and the access land use practices necessary for the safe and efficient operation of the highway system.