

MULTIPURPOSE PROJECTS ON THE TENNESSEE RIVER

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The purpose of this paper is to present the transportation planning implications resulting from the existence or construction of a multipurpose water resource project. The series of multipurpose dams and locks along the Tennessee River is discussed, and its benefits are listed.

•THE TENNESSEE River is a part of the Mississippi River system of 10,000 miles (16 000 km) of improved channels that connect 21 states. This system reaches from the Great Lakes to the Gulf Coast. Transmission lines carry power produced by hydroelectric and steam plants to the homes, farms, businesses, and industries in the 201-county Tennessee Valley region. Because steam plants are large, nonconsumptive users of water, their locations are made more economical by multipurpose reservoirs. A series of 9 multipurpose high dams with locks permits navigation on the entire length of the Tennessee River, which is 650 miles (1046 km) long. High dams also provide benefits such as flood control, hydroelectric power, recreational activities, and adequate water supply for homes and industry.

During the winter, Tennessee Valley Authority (TVA) lakes are drawn down to keep heavy winter and spring rains from causing severe flooding. Nearly all of the major floods in the Tennessee Valley have occurred in the winter and spring months. The multipurpose high dams help prevent floods by regulating runoff and flow. This creates usable land. But it also creates difficult policy decisions on allocating the land. TVA policy stipulates that only water-use structures and open nonstructural uses be permitted below the structure profile, which usually approximates the regional flood. Furthermore, only when overriding economic reasons offset the risk are structural uses permitted between the structure profile and the maximum probable flood. These policy decisions have a great effect on transportation planning. For example, if the floodplain below a dam is restricted to nonstructural daytime recreational use, then highway connections will not have to cross connecting rail spurs or carry industrial or commercial traffic.

The key to industrial development in an inland waterway region is not merely the availability of water transportation but also the availability of rail, highway, and deep-water transportation at the same location. At every point on the Tennessee River and its major tributaries where these 3 modes intersect and buildable land is available, waterfront industrial development has taken place. Transportation planners can forecast where rail and highway connections will be needed if the public and key public agencies approve of and support economic growth and if the multipurpose reservoir has a stable buildable shoreline with deep water within reasonable distance. TVA believes that rail and highway transportation should have a proximity of 15 flat miles (24 km); water transportation should have 1 mile (1.6 km) of dredging. If any of these is exceeded, the others are not likely to be needed for a long time under normal circumstances. Availability of a good transportation network and abundant electric power has encouraged industry to locate along the Tennessee River and its tributaries. There are more than 200 plants and terminals that provide more than 41,000 jobs.

Both inland and waterfront industry take advantage of low-cost barge transportation to ship raw materials and finished products to other industrial centers on the inland waterway and to foreign countries. If the hinterland industry produces or receives high-volume nonpackaged material, then public terminals will be needed. Their planning requirements are similar to those for waterfront plants. If the multipurpose

reservoir has unstable banks, requires excessive dredging, or if access channels silt up rapidly, industry will tend to cluster around the public terminal. Such concentrations cause problems and must be well planned for.

Recreation is 1 of the many purposes that only recently could be used as a benefit to justify public investment. All boats have 1 thing in common—they all have to land somewhere. About 22 percent will be concentrated at marinas and commercial docks. Regionwide or even statewide automobile peak-traffic figures related to these concentrations are not meaningful unless they are related to the type of marina and overall pattern of use. Connecting roads and parking areas need to reflect more than this because marinas have a tendency to expand rapidly. TVA deals with this when a permit is issued by setting the maximum water surface area the marina can expect to occupy. If a launching ramp is provided, then these figures have to be multiplied by a sizable factor. Trailer boaters take up a lot of room and have trouble on steep and curving roads. TVA recreation planners prefer to separate the launching ramps from the marinas and provide large parking areas and easy turnarounds to better serve the public.

Swimming areas usually have been located close to urban concentrations unless a large and diverse recreational complex such as a state park was available. Most multipurpose reservoirs have many sites that are physically acceptable for this type of recreation. Coves off the main stream usually are the best locations. In most cases closeness to the existing highway pattern is a location requirement.

Locating camping areas near reservoirs is exceptionally good. TVA has camping areas below dams where certain kinds of fishing are particularly good but the swimming is not. Camping areas also are above dams where swimming, fishing, and boating are good.

Multipurpose reservoirs create changes in residential patterns. Property values are increased. Multipurpose reservoirs do for residential development what interstate access points do for motels and service stations. Unless carefully planned, these reservoirs can create strip and sprawl development just as an unlimited-access highway can.

A new reservoir can change the riverfront of a metropolitan area by affording the opportunity to correct previous development mistakes. A new boundary will exist for usable land, bridges can be raised or relocated, and lateral roads can be replaced. When you see a large city with a beautiful, well-planned waterfront, you usually can conclude that it resulted from the construction of a reservoir.

For a very small incremental investment for dredging to extend the navigation depth and for land acquisition, it was possible to add an industrial park to the Melton Hill Reservoir project. However, in order to justify the increased investment, the builders had to get commitments on rail and highway rights-of-way, funding of rail and highway access, and support of nearby waterfront residential interests. Now 4 blue-chip company plants are there, and a fifth plant is being planned. This 1,000-acre (400-hm²) project will produce 2,000 high-paying jobs. The project also is compatible with nearby residential land use, a trout fishery, a fish hatchery, and a recreational waterway. It is worth all of the planning effort that was put into it. Multipurpose projects require extra planning, but they offer large returns on the effort.