U.S. Route 6
Brooklyn, Connecticut

Setting

U.S. Route 6 is the primary regional arterial carrying east-west traffic between Hartford, Connecticut and Providence, Rhode Island. U.S. Route 6 passes through the Town of Brooklyn roughly half way between the two cities. Route 6 is a major, principal arterial in rolling terrain operating with 8,000 to 10,000 vehicles per day at relatively high speeds on the approaches to the town. The Route carries substantial through truck traffic.

The Town of Brooklyn is typical of small Connecticut towns. The main road proceeds through the center of town. There are many historic and treasured features within the town, including the Town Hall, Unitarian-Universalist Church, the Town Green, an historic Well House, and a 150-year-old Copper Beach Tree. The Center of Brooklyn is designated as the Brooklyn Green Historic District and is listed in the National Register of Historic Places.

U.S. Route 169, a north-south primary arterial, crosses U.S. Route 6. U.S. Route 169 is a Connecticut Scenic Road and a National Scenic Highway.

The existing road for Route 6 is narrow, with narrow or no shoulders in many places. The horizontal and vertical alignment reflect outdated design criteria, produce sight distance deficiencies, and create difficulties for drivers. For much of the project area, residences abut the highway. The difficult alignment and poor sight distance adversely affect drivers entering and exiting driveways.

Improvements to U.S. Route 6 were identified as necessary as far back as the 1950s. Planning studies were conducted in the 1970s to investigate the potential for developing an expressway facility on independent alignment parallel to U.S. Route 6. Environmental concerns and opposition to the expressway resulted in it being dropped from consideration in the early 1980s. At that point, it was recognized that improvements to existing east-west corridors, and in particular to U.S. Route 6, were necessary.

Problem to be Solved

The 5-mile section of U.S. Route 6 was the last segment not upgraded. Problems to be addressed included replacement of the pavement that had deteriorated due to heavy truck traffic, improvements to the alignment to address safety problems, and improvements to the cross section to facilitate safe operations. The following specific traffic operational problems were identified associated with the combination of the geometry, traffic, and roadside conditions:

- Turning vehicles delay through traffic and create rear-end conflicts, and lack of shoulders limits the ability to perform emergency avoidance maneuvers

- Enforcement of speed limits is difficult due to lack of shoulders
- Driveway access and local mail delivery is a safety concern, due to poor sight distance and lack of shoulders
- Rock cuts, trees, drainage structures, and other objects represent hazards to drivers
- Poor pavement condition and inadequate drainage exists in many locations
- Four creeks cross U.S. 6 within the project limits

Stakeholders

- Town of Brooklyn (general public, adjacent landowners)
- Town Council
- Local wetland commission
- State Department of Environmental Protection
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Environmental Protection Agency

CSD/CSS Approach

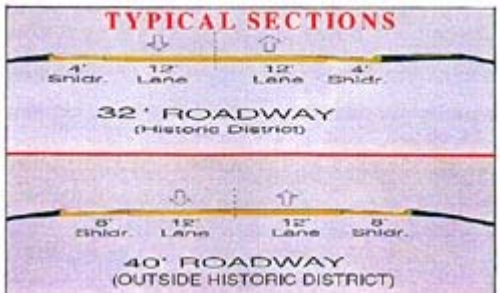
The Connecticut DOT looked at multiple alternatives to address the need to maintain and even upgrade the traffic carrying capability of U.S. Route 6. Among the alternatives considered was a bypass of the center of town. This would have meant running traffic through residential neighborhoods so focus was placed on improving the existing alignment.

Given the overall context, U.S. Route 6 was to remain a two-lane principal arterial. While residents of Brooklyn recognized the function of the highway, and also acknowledged their own concerns about its safety, they expressed strong preference for a design that did not adversely effect the character of the town, and specifically, the Green. Indeed, a concern of the town was the speeds of through traffic and conflicts with pedestrians and local business traffic in the town.

The project represented a design challenge. Improving the vertical alignment resulted in potential adverse effects on front yards, older trees, stone fences, and wetlands. Similarly, developing a functional, wider shoulder offered similar adverse impacts. It was necessary to select a design speed and execute a design that balanced the through-traffic carrying capability of the road with its impact on the community.

Design Flexibility and the Application of Design Standards

Connecticut DOT staff reduced the design speed from 55 mph to 45 mph on the approach to the town. This had the desirable effect of minimizing roadside impacts and facilitating driveway access. Emphasis in the alignment and cross section design was placed on developing speed consistency and reducing speeds gradually on the approaches to the town. Achieving this involved varying the cross section. On either side of the Historic District, full 12-foot lanes and 8-foot shoulders were designed, representing substantial geometric improvements over the existing cross section. Vertical alignment upgrades were accomplished, and minor horizontal alignment improvements were made. On the approach to the Historic District, the roadway is tapered from 40-foot total to 32 feet by narrowing the shoulders (the 40-foot width was retained in some locations that included commercial driveways). The narrowing of the shoulder was accompanied by signing and landscaping to visually narrow the feel of the road and promote lower speeds through the town. Sidewalks were added along one side of the road at the request of the Town.



Some horizontal curve improvements were made, and intersection improvements (including closing of some minor intersections to eliminate conflict points) were included. Signal system improvements were also included.

Throughout the design process, Connecticut DOT staff worked closely with all stakeholders to avoid adverse effects. Some operational and safety features, most notably a proposed truck climbing lane, were eliminated to minimize adverse effects.

Stakeholder Involvement

Town of Brooklyn stakeholders were initially skeptical of Connecticut DOT staff. A long and contentious history related to studies of the proposed expressway was a legacy to overcome. It was necessary to work hard to establish a positive working relationship.

The relatively close right-of-way and frequent points of conflict represented challenges to the DOT staff attempting to explain design concepts, and to town residents concerned about effects on the Green, the church, and the Copper Beach tree.

Connecticut DOT staff used visualization techniques for one of the first times to help depict designs and discuss alternatives with the townspeople. Visualizations were particularly helpful in investigating alignment and intersection concepts through the Green.

From: NCHRP Report 480, Transportation Research Board