

## Maryland Route 355

### Setting

Maryland Route 355 was a two-lane highway in Montgomery County linking communities in the Gaithersburg/Germantown area. The arterial parallels Interstate 270. The route passes through Great Seneca Creek State Park. At the southeast project limit is one major signalized intersection with Maryland Route 124. Other signalized intersections along the corridor include Middlebrook Road, Maryland 118, and Maryland 27. The 2.6-mile route passes through residential areas, parks and open space, and commercial areas.

Significant regional traffic growth and localized development resulted in traffic increases along Route 355. The two-lane highway, originally designed as a rural road, became congested. Reconstruction of the route to accommodate existing and projected future traffic demand was apparent.

### Problem to be Solved

The identified problem was to provide enhanced mobility for those using the Maryland Route 355 corridor. Mobility issues included through traffic, intersection conflicts and bottlenecks, access management, and providing for pedestrians and bicyclists.

### Stakeholders

- City of Gaithersburg
- Maryland National Capital Park and Planning Commission
- Maryland Department of Natural Resources
- Numerous Utility Companies (water, gas, cable TV, telephone electric)
- Community associations (Wheatfield Homeowners Association, Foxchapel Homeowners Association, Montgomery Village Foundation)
- Individual residential property owners
- Major employers (Lockheed Martin)
- Other business owners along the corridor (e.g., Holiday Inn, Aamco)

### CSD/CSS Approach

Completion of this major project required a comprehensive approach involving design creativity, stakeholder involvement, and agency coordination. This project also illustrated well the importance of maintaining context sensitivity and flexibility all the way through construction. Staff from Maryland SHA noted that this project illustrated well that having good people involved who were flexible, who could "roll with the punches," was a critical success factor.

While stakeholders recognized the need for the project and understood the proposed solution, they expressed concerns and desires about the execution of the design. Through numerous meetings, design revisions, and tailoring of the project, a context sensitive design solution was accomplished.

### Design Flexibility and Application of Design Criteria

Fitting the desired cross section (a six-lane divided arterial with 12-foot lanes) into the corridor required design flexibility along the route. Three notable examples are illustrated in the following photos.



At one location, a special modular masonry retaining wall (see photo 18) was constructed to retain parking areas and driveway access to commercial businesses. Special design was necessitated when a problem with design mapping was found; the solution retained the key functionality of the plan.

At another location, preservation of mature trees required special design due to widening and profile requirements. Rather than a concrete or masonry wall, special timber wall designs were used (see photo 22) that blended into

the surrounding area better.

Perhaps the most notable feature of the project is the design to accommodate the retention of a prominent, beautiful mature oak tree. Original plans for the widening showed the tree needed to be taken. Design staff from the SHA reviewed the alignment and cross section, inspected the tree and surrounding areas in the field, and committed themselves to preserving the tree through re-design. (see photos 7 and 8). The cross section and horizontal alignment were adjusted to place the tree in the median of Route 355. The profile of one direction of travel was raised to create space for the tree's root system, and a special irrigation and monitoring system was designed. Steel-backed, timber -faced guardrail (meeting NCHRP 350 crash testing requirements) was used to shield the tree. (This more expensive guardrail system was used elsewhere on the project, including at Great Seneca Park, to blend into the natural surroundings.)



The design also demonstrated a commitment to enhance the mobility of pedestrians. An 8-foot-wide, multi-use (pedestrians and bicyclists) path was constructed, including brick splitter islands and special crosswalk treatments at intersections. Plantings were used at certain locations to protect bicycle riders from steep slopes at drainage structures. At a high volume bus shelter, the area for the multi-use pathway was expanded to accommodate both users and transit riders.



### Design and Construction Enhancements – Fitting the Context

Design and construction staff made a concerted effort to minimize the adverse effects of this major widening project. At Great Seneca Park, the project included reforestation and provision for a parking area and access pathway into the park. At other locations, similar field changes were made to drainage swales, pathway location, and utility relocation to enable retention of large trees. During construction, field staff noted that changes in the grading plan would enable the retention rather than loss of a significant number of major trees along the right-of-way; the changes were made.

Special plantings were used at stormwater ponds for neighborhoods, preserving the natural feel for the area. At another stormwater pond on the Lockheed-Martin property, an agreement was reached between the SHA and Lockheed-Martin for the use of the pond, and for replacement and additional plantings. Other field changes were made to accommodate plantings at a number of commercial and residential properties (Holiday



Inn, Montgomery Village Apartments).

Application of Montgomery County's stormwater management ordinance would have required taking of trees at one location. An alternative, use of a wetland bank, was agreed to by all stakeholders as the preferred solution.

Design enhancements even extended to individual property owners. SHA's construction engineer, noticing a difficulty that would be faced by a resident using a reconstructed driveway, offered to construct a driveway T on the resident's property to facilitate safely turning around and entering the arterial (rather than backing onto it).



### **Stakeholder Involvement**

Tailoring of the design, resolving problems, and developing site-specific solutions required significant effort to work with individual stakeholders. The discussion above highlights some of this activity. There were many other examples of working with stakeholders to accomplish a finished design. For example, the SHA negotiated an Memorandum of Agreement with the City of Gaithersburg in which the city agreed to take responsibility for median and roadside plantings within city limits. In turn, SHA was able to commit to an enhanced landscaping plan above that they otherwise would have implemented.

Individual agreements with homeowner associations were also reached for plantings and aesthetic treatments. In one location, agreements were reached with property owners to include wood fencing on top of retaining walls for noise attenuation and improved privacy.

Extensive coordination with other governmental agency stakeholders also occurred. In addition to the design improvements at Great Seneca Park, parking and pathway improvements, use of timber faced rail illustrate concerns about the facility blending in with the Park.



### **Lessons Learned**

A number of key lessons can be gleaned from this case study. First, CSD/CSS applies all the way through construction. Indeed, many of the long lasting positive features of the constructed solution were arrived at in the construction phase. Second, related to the above, effective CSD/CSS requires a local presence in the field. Third, active engagement with individual stakeholders is necessary to maintain context sensitivity. Solving problems one by one requires working on an individual basis. Fourth, paying attention to details is important. The cumulative effect of a long series of small, seemingly insignificant actions can have a measurable effect on the final product and on stakeholder perceptions of the agency (SHA).

Finally, a lesson learned is that bringing the right resources with the right sense of professional responsibility and environmental stewardship, who are flexible and able to deal with a number of unforeseen circumstances, is essential to project success. Converting a two-lane highway into a six-lane arterial in a built-up area, and doing so in a manner that the finished project fits with the surrounding area, is no small feat.

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