



CHALLENGE

AN ENVIRONMENTALLY-SENSITIVE DESIGN WAS NEEDED TO IMPROVE ACCESS AND TRAFFIC MANAGEMENT FOR I-77.

SERVICES

- Bridge Design
- Civil Engineering
- Design-build
- Drainage Design
- Structures
- Subsurface
- Survey
- Traffic Engineering

AWARDS



2009 OUTSTANDING HIGHWAY
PROJECT OF THE YEAR

American Society of Highway
Engineers (ASHE), Cuyahoga
Valley Section

I-77 WIDENING

ms consultants' involvement with this project has a long history. ms worked closely with the I-77 Corridor Committee to identify the importance of widening this

north-south corridor to three lanes in each direction, between U.S. 30 and U.S. 224, and the critical need for a new interchange at Shuffel Street. These two

improvements would affect improved access and traffic management solutions in that region of the corridor and in turn, help produce enhanced regional economic development benefits. The interchange will promote access to the County's Foreign Trade Zone located at the Akron-Canton Regional Airport. Environmental and engineering studies expanded to include the relocation of Shuffel Street from Frank Avenue to Pittsburgh Avenue, a Noise Barrier Analysis for the I-77 mainline widening and proposed interchange modifications from U.S. 62 to S.R. 241, a distance of 16 km.

This project involved design of a new modified-diamond interchange along with realignment of approximately 1.25 miles of Shuffel Street. The existing Shuffel Street bridge over I-77 was removed and replaced with a new four-lane structure along the proposed alignment. The new alignment for Shuffel incorporates four intersections with county/township roadways in

addition to the two interchange intersections. Traffic signal warrant analysis was performed and traffic signals designed for these intersections as necessary. Provisions for a future traffic signal interconnect system was incorporated into the design. Highway lighting was designed for the interchange area. The existing Zimber Ditch culvert was replaced. Final design included drainage, roadway plans, minor and major signing, pavement marking, and maintenance of traffic plans. Ground survey and cut and fill calculations for the proposed realignment were also developed.

Additionally, traffic growth warranted additional lanes and modification of access points. As a result of an interchange justification study by ODOT in 1995 and 1996 and with support of the Ad Hoc I-77 Corridor Committee, ms consultants proposed widening I-77 from U.S. 62 to S.R. 241 (three lanes in each direction).

ENVIRONMENTAL PLANNING AND NEPA DOCUMENTATION

In the Preliminary Development Phase, ms conducted preliminary environmental and engineering studies for the new interchange, complying with NEPA study guidelines, assessing ecological, hazardous material and wetlands conditions and solutions. All the while, ms coordinated its efforts with the Stark County highway and Akron-Canton Airport expansion projects. Further, ms completed detailed noise barrier analyses for the mainline improvements.

The Shuffel Street project required a Section 404 permit and a Section 401 Water Quality Certification. The interchange realignment required the relocation of a small stream that empties about 14 acres with an average bankfull flow of 70 cfs. Using an unimpacted upstream section to serve as the morphologic reference reach, ms designed the relocation of the stream from a roadside ditch setting to an overland flowing system. The project required a dual use of the relocated facility; first, to improve water quality; and second, to retain the 50-year storm. Water quality was addressed via aeration using Newbury riffles, which also provide habitat enhancement. Hydraulic

issues were addressed by designing the channel as a Rosgen "C" channel with a meander pattern and riffle/pool system appropriate to the types of flows expected based on the hydraulic calculations. A landscape plan, using appropriate riparian vegetation, was developed to allow for bank stability and reduced maintenance duties along the stream channel.

ms consultants was the first private consultant in Ohio to be awarded the design of a stream relocation using ODOT funding.

Because of the proximity of the Akron Canton Regional Airport, on-site wetland mitigation was not feasible. Through coordination with the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency, an agreement was reached that allowed ODOT to provide wetland mitigation through an "in lieu" fee arrangement with the Cleveland Museum of Natural History. Through this agreement, ODOT provided funds that assisted in the preservation of a highly significant Category 3 wetland area in Summit County.