

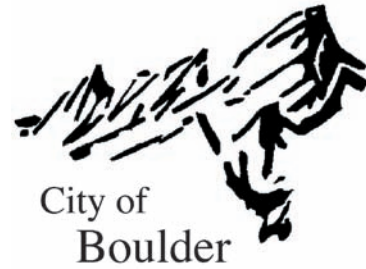
# Drainage & Flood Control

## Elmer's Twomile Greenway

Nominating Agency: City of Boulder

**Accomplishment:** City of Boulder completed the construction of the Elmer's Twomile Greenway project from Goose Creek to Glenwood Dr. in June 2010. The Elmer's Twomile Greenway project is located in north Boulder between 26th and 28th streets in one of the most developed urban corridors of the City. The project included a grade-separated, multi-use path connection from Goose Creek to Glenwood Drive (approximately 0.5 miles), a combined bicycle/pedestrian and flood conveyance underpass at Valmont Road and 100-year flood mitigation improvements.

The transportation improvements provide a missing link in the path system between the area north of Glenwood Dr. and the entire Boulder Greenways path system. The flood mitigation improvements address flooding that would occur south of Glenwood to the confluence with Goose Creek during a 100-year storm event. Numerous properties east of the Elmer's Twomile channel along 28th Street were in the 100-year conveyance zone, and portions were also in the City of Boulder's high hazard zone. This project removed these properties from the 100-year floodplain by containing the flows within the newly completed



Elmer's Twomile channel. In addition to providing flood and transportation improvements, the project also included habitat and water quality enhancements.

**Innovation:** This project enhanced the surrounding environment. Prior to the construction of these improvements, Elmer's Twomile Creek was an undersized small concrete trapezoidal channel with chain link and wooden fences on both sides. Rayback Plumbing used the one-acre parcel to the east of the channel and north of Valmont Road as a storage area for hundreds of used sinks, toilets, bathtubs and plumbing parts. South of Valmont, the channel passed behind a strip mall and flowed into the Boulder and White Rock Ditch. The area adjacent to the channel was viewed as a no man's land and was a dumping ground.

The existing channel passed through a very developed urban

corridor, with limited space to allow for an open channel that would contain the 100-year storm event. Several channel width options were evaluated prior to eliminating an open channel concept for an underground box culvert. A wider, open channel (36-ft. wide) would have required the removal of 50 parking spaces in the Tebo Plaza shopping mall and all of the mature trees east of Willow Brook Condominiums. The channel would have retaining walls five- to eight-feet-high on both sides, with the distance between the retaining wall on the west side of the channel and the Willow Brook Condominiums as close as 10 feet. By reducing the channel width to 30 feet and moving the channel closer to the condominiums, the number of parking spaces impacted would be reduced, but the height of the retaining walls would increase and the distance between the retaining wall on the west side of the channel and the condominiums would be as close as four feet. In these areas, box culverts were installed in order to minimize impacts on adjacent properties.

Underpass structures were designed with a minimum cover, which shortened lengths and maximized the natural lighting and openness.

Where space was available, wetland pond areas were created to provide water quality, habitat and aesthetic enhancements. The project was also landscaped in such a way to provide privacy to adjacent property owners and enhance the user experience. While it is not the City of Boulder's preference to utilize box culverts in lieu of an open channel, this approach made it possible to minimize impacts on existing vegetation and urban development.

**Achievement:** The Elmer's Twomile Greenways project achieved multiple objectives. It provided enhancements to public health, safety and welfare from the perspective of removing properties from the 100-year floodplain and the City of Boulder's high hazard flood zone, as well as improving the safety of pedestrians and bicyclists. The improvements also promote public health by encouraging people to use alternative transportation while providing a missing link in the grade-separated path system, with connectivity to commercial areas and the entire Greenways path system.

**Transferable:** This project can serve as a model for other communities and other City of Boulder projects.

**Cooperation:** Elmer's Twomile Creek is part of the City of Boulder's Greenways system, which is comprised of a series of corridors along riparian areas, including Boulder Creek and its tributaries. The purpose of the Greenways program is to integrate multiple objectives, including habitat protection, water quality enhancement, storm drainage and floodplain management, alternative transportation routes for pedestrians and bicyclists, recreation and cultural resources. The



*Centennial Engineering, Inc. provides transportation consulting engineering to public and private sector clients for trails, streets, highways, intersections and interchanges in urban, suburban and rural settings. Our expertise includes structural, traffic, and roadway engineering; intelligent transportation systems; and information technology networks. We manage successful projects from concept through construction.*

Elmer's Twomile project provided an opportunity to maximize the overlap of these objectives through the coordination of various City departments and outside agencies. The overall project was a team effort, combining input from various City departments as well as to two outside agencies: Urban Drainage and Flood Control District and Colorado Department of Transportation, with the design provided by the consultant team of Centennial Engineering and WHPacific.

The project was designed and built by City of Boulder in cooperation with UDFCD and CDOT, and Concrete Works of Colorado was the general contractor. Flood utilities funds were leveraged with Federal

transportation funding. The project required 22 easements from nine property owners, three of which were homeowner associations with numerous residents. In addition to addressing the various interests and concerns of adjacent property owners (privacy, security and aesthetics), water rights issues and ditch crossing concerns were also addressed with Boulder and White Ditch Co. This project was completed within the specified budget and schedule and had a total project cost of \$8.8 million including design, property acquisition, construction and the Letter of Map Revision.

**Summary:** The Elmer's Twomile project achieved multiple objectives. It provides a missing link in the grade-separated path system, with connectivity to commercial areas and the entire Greenways path system, with the flood mitigation improvements removing numerous properties from the 100-year floodplain and the City of Boulder's high hazard zone. It provided water quality, habitat and environmental improvements and it enhanced the economic vitality of an important commercial area, as well as improving the aesthetics of a high-density residential neighborhood. ●

