

## Fluvial Geomorphic and Sediment Transport Analysis of Brush and Rock Creeks

City of Mission Hills, KS

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The purpose of the Fluvial Geomorphic and Sediment Transport Analysis of Brush and Rock Creeks project was to improve flood protection for streamside residents, without excessive disturbance to the stream or the neighborhood. The analytical methods used included hydraulic and fluvial geomorphologic elements. By making full use of both technical disciplines Intuition & Logic was able to determine the causes of the frequent flooding.

Aside from the increased flows delivered as a consequence of upstream development, we found that Brush Creek floods so frequently because of three inter-related phenomena. First, existing structures including bridges and weirs created a set of backwater conditions that make flooding almost inevitable. Second, the stream does not transport sediment competently throughout its length. A series of stream power peaks and troughs cause sediment to build up in some areas, reducing flood capacity while scouring fresh sediment from the bank elsewhere. Finally, the geologic control manifested as limestone outcrops dominates the stream's ability to adjust its channel size and profile.

In addition to the geomorphic and sediment transport analysis, Intuition & Logic conducted a Value Planning (VP) workshop to more effectively integrate the analysis and design. At the conclusion of the workshop the design team developed one recommendation consisting of several actions that, when combined, improve flood protection for all the affected houses. Special considerations were given to preserve long-standing structures along the creeks, such as the stone masonry walls and bridges, in order to sustain the beauty of Mission Hills while establishing a better coexistence between with the creeks and the city's residents.

