St. Vrain Creek Floodplain Mitigation/FasTracks TOD Site Drainage Improvements, Longmont, Colorado

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Through the City of Longmont, historical encroachments within the St. Vrain Creek floodplain include residential, commercial and industrial development, as well as numerous bridges that serve various modes of transportation within the City. The floodplain corridor has also been subjected to aggregate extraction and the subsequent development of remnant ponds and adjacent open space. These activities have all served to influence the location and extent of flood hazards along St. Vrain Creek. There are hundreds of buildings located within the currently effective 1-percent annual chance of occurrence floodplain along St. Vrain Creek.

The proposed FasTracks Transit Oriented Development (TOD) Project would include redevelopment of approximately 17 acres adjacent to St. Vrain Creek. Much of this site is contained within the effective 1-percent annual chance of occurrence floodplain associated with St. Vrain Creek. The site is also subject to receiving local storm runoff from the residential, commercial and industrial areas to the north and northwest.

The purpose of this study was to update the flood hazard delineation through the City of Longmont and adjacent areas within Boulder County, identify improvements for reducing riverine flooding of the TOD Site, as well as other properties in the St. Vrain floodplain, evaluation local drainage conditions for the TOD Site, and formulate a coordinated plan of drainage improvements for the TOD Site in order to mitigation local flooding potential. To accomplish these goals, the following tasks were completed:

(a) preparation of current aerial photography and digital topographic work maps, in conjunction with field survey information collected for the project;

(b) field reconnaissance efforts to characterize channel and overbank conditions and roughness coefficients, as well as to assess hydraulic structure and bridge conditions;

(c) hydraulic modeling, using HEC-RAS, of a 6.7-mile reach of St. Vrain Creek, as well as an additional 5.4 miles of split and divided flow paths, including the modeling of numerous lateral weirs and flow diversions, irrigation check structures, and bridges;

(d) flood hazard mapping of the 1- and 0.2-percent annual chance of occurrence floodplains and the preparation of digital floodplain work maps;

(e) preparation of digital flood hazard data in DFIRM format;

(f) preparation of text, tables and graphical flood profiles in FIS format to support a pending PMR submittal to FEMA for incorporation into the Boulder County FIS and DFIRM;

(g) formulation and evaluation of alternative riverine flood mitigation measures along a 4-mile reach of St. Vrain Creek.
(h) hydrologic modeling of the TOD Site and tributary basin using EPA-SWMM in order to quantify local stormwater runoff associated with the 5-year and 10-year storm events;

(i) formulation and evaluation of alternative drainage improvement plans for the TOD Site in order to mitigate flood potential due to local runoff;

(j) preparation of preliminary design information for the alternative site drainage facilities, including:
   i. two meandering grass-lined channels;
   ii. two large box culvert crossings of Boston Avenue;
   iii. a multiple barrel culvert crossing of the BNRR; and
   iv. a 0.2-mile storm sewer which also crosses under the BNRR.

(k) documentation supporting the preparation of the topographic work map, field reconnaissance efforts, hydrologic modeling, hydraulic analyses, floodplain mapping, alternative evaluation, and identification of a recommended alternative; and

(l) coordination with the City of Longmont throughout the project.