Curry Street Stormwater Master Plan

Carson City, Nevada

CLIENT

Carson City , Nevada

SCOPE OF SERVICES

Advanced GIS Hydrology

NEXRAD Rainfall and Streamflow Data

Simulation

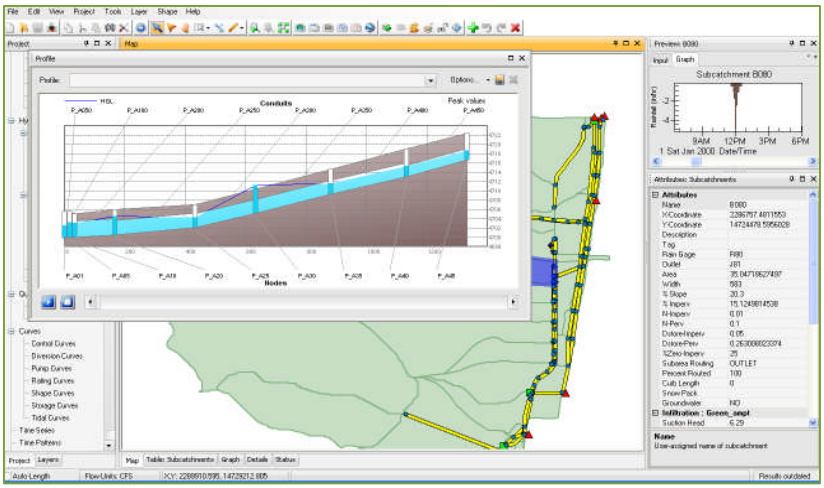
Parametric Calibration

Stormwater Model Optimization

Floodplain Analysis/Mapping

Stormwater Facility Hydraulics

Dynamic Runoff Flow Routing



This Stormwater Master Plan was developed in conjunction with proposed roadway and storm drain improvements for Curry Street, Rhodes Street, and Carson Street (US 395) in southern Carson City, Nevada. To adequately analyze the hydrology and mapped flooding hazards within this region, the watershed study area was expanded to include approximately 2.9 square-miles of rural and urban lands - including several western canyons that are major tributaries to the Carson River. Detailed GIS-based hydrologic analyses were performed to compare several modeling methodologies for the watershed utilizing NEXRAD rainfall and historic streamflow gage data. This comparison resulted in a determination of the most consistent runoff estimation method for optimizing input parameters and calibrating modeling flows with historic gage measurements.

Over the past several years, numerous hydrology studies have been prepared for the Curry Street watershed, or portions thereof, using provincial methodologies and unverified assumptions. The results from this Master Plan calibrated modeling, being the most comprehensive and validated rainfall-runoff modeling performed to date, demonstrated that all previous hydrologic studies for the Curry Street region substantially over-predicted peak stormwater runoff flow rates. Consequently, the reduced peak flow rates now anticipated for the proposed Curry Street stormwater management facilities, as well as the FEMA Flood Hazard Zones in the watershed, could be reduced in size and breadth from what would have otherwise been conventionally indicated.

In addition to the hydrologic modeling, six master plan alternatives were developed and analyzed for the proposed roadway improvements and stormwater management facilities. In the formulation of each alternative, GIS-based dynamic hydraulic models were utilized to analyze anticipated stormwater flow rates and size proposed facilities. This approach allowed for the simultaneous evaluation of surface flow (in streets and channels) with subsurface flow (in buried storm drains and culverts) across a broad range of design storms and flow regimes. Furthermore, the GIS-based dynamic modeling allowed for quick and efficient “what if” scenario considerations throughout the master planning process. Once the modeling and analysis was completed, each alternative was accompanied by an objective performance assessment and a preliminary cost estimate.