Using DRCOG planimetric data to evaluate municipal storm drain improvements

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Front Range municipalities face numerous challenges when planning for infrastructure improvements to reduce damage in the event of a major storm. As a consultative civil engineering firm, Icon Engineering provides services to perform benefit cost analysis within a desired basin to assist in the evaluation of proposed storm drain improvements. DRCOG's planimetric data represents the effect quality geospatial data can have in performing a benefit cost analysis and translates to real-world improvement in the communities impacted by flooding.

A combination of hydraulic and hydrologic modeling is implemented to estimate potential runoff and inundation limits for flooding. Planimetric data, including building and sidewalk outlines, are used when developing land use parameters and blocked obstructions for hydraulic modeling.

On the GIS side, building data is paramount. There are several methodologies for determining damage against a given structure. The Federal Emergency Management Agency has set the standard with damage curves for a wide variety of building classifications. Building data is combined with additional tables, such as assessor's data, which help in classification. A series of zonal statistics is run against baseline terrain to determine the lowest adjacent grade on a structure and against the 2D hydraulic model results to sample projected water elevations and flooding depth on inundated structures. The results are brought into a database where calculations are run against all hypothetically inundated structures and then compared to existing conditions.

The evolution of data, including DRCOG's planimetric dataset, has allowed for more granular analysis. Estimating total flood damage provides a crucial basis in determining how funding will translate into community improvement.