# Image Integration with GIS

One goal of NASA's research and application efforts is to implement and operationalize the use of remotely sensed imagery and technologies within the day-to-day business operations and management of government. A major stumbling block to this integration is the issue of the positional accuracy of the existing line-work within the governments vector GIS database. This inaccuracy manifests itself when overlain to more positional consistent imagery data as well as when GPS data are used. This is a common problem with GIS, GPS, and imagery that is occurring within governments across the nation. NASA sponsored research has allowed the creation of tools and approaches governments can use to co-register multiple layers of GIS information to an imagery base and migrate their investment in GIS to better positional accuracy.

Societal Benefits – Local governments have made significant investments in GIS data development (i.e. Springfield, MO - $15 million, 194 person years, 175 data layers). Many of these investments were founded on paper maps with little positional accuracy. When used as base map resources, the resulting GIS layer is a database with many forms of inherent positional error. This information does not map well to the imagery products provided by NASA or the private sector. Local governments are reluctant to use or show imagery if the imagery displays significant errors in their data. The ability to 'correct' these errors in a systematic and repeatable process that enables their investment in these data layers to be maintained into the future is critical to NASA's, or the private sector's, ability to integrate remote sensing products in these environments.
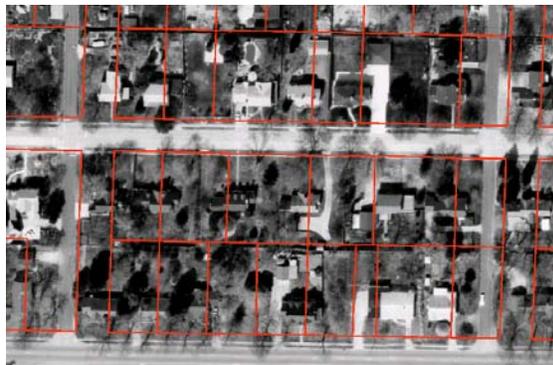
NASA's Unique Capacity and Contributions – A NASA funded process was developed that uses tie-points from imagery sources to a GIS base map layer (i.e. parcels) to create a gridded continuum of linearized adjustments. Once adjusted, the line work is reassembled and topology reestablished. This tool has maintained the integrity and the relative-positional accuracy of the vector data. In addition, the tool documents the positional accuracy of the new vector data layers.

Decision Support Solutions – Local governments have responsibilities mandated from the City, County, Utilities and State Legislature. These mandates relate to record keeping in many forms, map/drawing productions, maintenance, economic development, and ultimately public safety.

NASA's support of this application has provided future decision-makers, and the public, with a much needed level of confidence in the information they are using. The project allows county, city, and private sector users to maximize the use of spatially integrated remote sensing and GIS vector data.