

Uses of Aerial Photography in GIS and CAD at Sandy City

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Here's some notes about things we have used aerial photos for in Sandy. This is by no means a complete list. As the GIS Admin I get to see what people in all departments are doing with GIS, not just a focused area like, say, Public Works.

Community Development

- Public presentations
- Used to compare Zoning or Land Use to condition and design of homes by neighborhood, helping them to analyze related needs and priorities.
- Used as a component of designing new Master Planning documents. Easy way to help the members of the public giving input to get oriented.
- By combining our Annexation GIS layer with historical photographs, it's easy to see what the City looked like at various points in time and when developments occurred relative to the annexations.
- Examining and inventorying existing land uses.

Economic Development

- Promote business re-locations. Many businesses considering locating here from out of state have no idea what our commercial centers look like. Aerials are a good way to give a good impression. We often get requests from the management of the malls for such maps.
- Used as a source to create a walking analysis. A developer wanted to show how far and what businesses could be walked to in 5 or 10 minutes from a proposed location of a new office tower. Using the photos as a source, we created a GIS Network of the sidewalks, crosswalks, and other features to do a walking route analysis. Result was a set of polygons used on a map to show the 5-minute and 10-minute areas. (Got them the map they wanted in 24 hours.)

Emergency Management

- Established FEMA helicopter landing sites for emergency food/water PODs (Points of Distribution). Each site needs a certain radial distance for clearance, and an open level field. This analysis was impossible without photography, as something like, say, parcels don't have enough information.

Fire

- Planning/ Training exercises- access in scrub and wooded areas, off-road route planning.
- Planning/ Training- we've used photos over DTM to create a 3D view for teaching firefighters routes to hard-to-reach areas on hillsides.
- Design safe walking route maps. For every elementary school in Sandy, we construct a map as a handout for parents that show the safest routes to/from schools. Many people don't "get" maps, but they do "get" a photo. We use the photo to easily see where sidewalks, crosswalks, walkways between parcels, etc are present, and combine that with the speed limits on the road centerlines GIS layer to establish best routes.

Information Services

- Photos were used to help establish line-of-sight for our WAN (Wide Area Network) point-to-point radio connections between buildings.

Legal

- Court cases. Example: map with aerials was used to show relationships between violations and neighbors, to inform jury. Makes a greater impact to SEE what the effects of a drunken party were by showing locations of people several homes away that were complaining. If this was done on a plain map, the impact of seeing the homes involved would have been lost, as it would have looked like a bunch of lines.
- Another example was using historical aerial photos to show that a home has had a history of zoning violations going back 15+ years (backyard auto repairs) when Sandy filed a case to shut it down. (Next to school, pollution, smells, noise, etc.)
- On the other side, I've had a citizen come in requesting a photo to prove in Court that the red light he was accused of running could not have been seen by the officer from the position of the officer's car. (Interesting argument- I don't know if he was telling the truth or not, or how it came out.)

Parks

- Aerials were used to locate existing official and unofficial trails for management, planning, development. Trails were traced from photos into new GIS layers, and assigned values such as width, type, material, and condition. Without aerials, this would have taken weeks of field work.
- Aerials were used to establish tree locations for inventory and management.
- They were used for planning of new trails to add to the city trail system.
- Photos plus parcels were used to establish that a person had indeed "unofficially extended" their landscaped yard onto city-owned property dedicated for a future right of way. (Issue was that Parks needed to cut growth along the right of way, and ran into this area that the resident claimed was his.)
- Parks uses aerials as one of the GIS layers on their field GPS units as a guide to locate items.

Police

- SWAT raid planning (photos used to see things like fences and trees to pre-position officers).
- Accident/crime investigations. Used aerials as a backdrop for a map of evidence (blood, shell casings, tire marks, glass, etc) that were measured on-site by the Crime Scene Unit. Relationships among these items and un-measured items like nearby trees, streetlights, etc would be hard or impossible to understand without the photo tying it all together.
- D.A. presentations such as an analysis of the 1000' radius from a drug bust to schools and churches for the enhanced penalty. Seeing the nature of the neighborhood (homes? Industrial?) makes an impact.
- Analyze things not in the GIS like walking routes from drug locations to schools.

Public Works

- Road and sidewalk conditions- see cracks, etc; useful for planning repairs.
- Site plan design- used as backdrop for analyzing proposed developments. See things like old fences that might not be in the GIS.
- Photos in a 3D setting were used to help understand why a driver went off of Dimple Dell Road into Dry Creek. Was our signage at fault? (no- drunk).
- Photos are a great source to create GIS layers of paint on roadways, such as street striping, crosswalks, and so on. These GIS layers can then be used for budgeting/- predictions of amounts of paint needed, etc.

- They also use aerials as one of the GIS layers on their field GPS units as a guide to locate items.

Public Utilities

- Drainage patterns, manholes, storm grates, ditches, canals, etc all located
- They also use aerials as one of the GIS layers on their field GPS units. Having the photo as a backdrop makes locating valves, smaller features much easier during fieldwork, since you have a guide to what's around an item being sought.

Several departments use the aerials to perform approximate measurements of items- house from sidewalk, pole from curb, meter from fence, paint stripe from road edge, and many others.