



# Aerial Mapping

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# Midwest Aerial Photography



## Midwest Aerial Devises Custom Collection Strategy to Acquire True Orthoimagery of Canadian Capital

Concerned with the potential for building lean in aerial imagery over downtown Ottawa, Ontario, Canada's National Capital Commission released an RFP calling for acquisition and delivery of true orthoimagery in which every pavement edge and sidewalk would be clearly visible between tall buildings. TDB Consultants Inc., a Canadian resource management firm, teamed with Midwest Aerial Photography to provide distortion-free orthomosaics that met the Commission's stringent specifications.

"Building lean is a distortion in which tall structures appear to lean outward from the center of aerial photographs," said Midwest Aerial President Ken Scruggs. "As a result, the ground surface immediately below the building is obscured from view."

This creates problems for organizations that need to map infrastructure assets from air photos in downtown areas. Sidewalks, curbs, and any features on them, such as manhole covers, utilities, handicap access, and fire hydrants, are hidden from view. Such was the frustration experienced by the National Capital Commission, a Crown corporation tasked with developing, maintaining, and improving Ottawa's Capital Region in and around its famous Parliament Hill.

For the 2011 project, the Commission sought orthoimagery covering 1,380 square kilometers of the Ottawa metropolitan area at 20-centimeter pixel resolution. Deliverables were to include natural-color orthoimages, each with accompanying digital elevation models, and a seamless mosaic. Horizontal accuracy had to meet Canada's 1:2000 scale digital topographic mapping database with 90 percent of features located within 0.50 millimeters (at map scale) of their true positions. And the imagery had to be acquired in a tight window before leaf-out.

TDB has a 25-year history specializing in land management, geomatics, and engineering, winning the contract to deliver the true orthoimagery. The Canadian company had worked with Midwest Aerial Photography on two earlier projects and sub-contracted the aerial portion of the Ottawa assignment to the Columbus, Ohio, firm specifying use of one of Midwest Aerial's two Z/I Imaging DMC II-140 digital mapping cameras.



**Ottawa's Famous Parliament Hill**



**True Ortho of Central Business District**

“Based on their prior experiences working with us, TDB knew the DMC II could do the job,” said Scruggs. “The DMC II provided the accuracy and geometry required for this project, and TDB appreciated how easily the digital data integrated into their image processing workflow.”

Having built its reputation in the geospatial industry as a firm that specializes in reliable aerial images and photo acquisitions regardless of tight schedules and complex airspace, Midwest Aerial left nothing to chance for the Ottawa collection. To ensure acquisition of high-quality imagery without building lean, Midwest developed a customized flight plan for the project.

The Midwest team used Google Earth to pinpoint coordinate points for every street intersection in Ottawa’s densely developed city center. These points were entered into the DMC II Z/I Mission Flight Management Software as the precise locations where each image frame would be captured. Taking into account the camera recycle rate of 2.2 seconds, Midwest calculated the frames could be successfully acquired at a ground speed of 125 knots or less from the 8,400-foot altitude above ground required for 20-cm pixel resolution.

“We created two flight plans – one for the central business district with the tall buildings, and another for the outlying Ottawa metropolitan area,” said Scruggs. “For the central business district, we flew down every major street from the

southwest to the northeast, capturing images at every intersection, which resulted in an as much as a 96 percent side lap and 93 percent forward overlap.”

By collecting images directly over every street intersection with more overlap than typically needed, Midwest Aerial ensured that every roadway, sidewalk, curb, and surface feature between the numerous tall office buildings and condominiums would be captured in multiple frames from one or more angles. The goal was to give TDB plenty of true vertical imagery to choose from when generating the orthorectified products.

The acquisition strategy worked as planned. From the 3,300 image frames collected by Midwest Aerial over Ottawa, TDB generated 345 orthorectified image scenes, which were also mosaicked into a seamless map sheet, virtually eliminating building lean, ensuring all street surfaces, pavement edges and sidewalks were fully visible even among the tallest buildings in Ottawa.

“Our client was extremely satisfied with the product and informed us these were among the best orthoimages they had ever seen,” said Rob Kragt, TDB Director of Geomatics.

An often overlooked factor in aerial image collection that contributed to the timely delivery of end products in the Ottawa project was the quality of the aircraft location and attitude data recorded by the NovAtel SPAN GPS/IMU device used by Midwest Aerial. TDB easily ingested the

GPS/IMU data into its ImageStation Aerial Triangulation software and completed the AT segment of the orthorectification process for all 3,300 image scenes in just three days..

“[We] moved onto orthophoto production and mapping within one week of receiving the materials,” said Kragt. “The end result was a product delivered on time and on budget with a very satisfied client.”

Midwest Aerial now uses the tightly coupled GPS/IMU on all acquisition flights and finds these data sets are vital deliverables to partners and clients who are performing the image processing portion of a project.

“Attention to seemingly small details like the selection of a GPS/IMU and the creation of a custom collection strategy have a cumulative impact on the overall quality of an aerial imaging project,” said Midwest’s Scruggs.

## CORPORATE PROFILE

### Midwest Aerial Photography

For 23 years, Midwest Aerial Photography has focused on acquiring aerial imagery and photography of the highest quality to support photogrammetric mapping projects across the United States and Canada. Our goal is to meet the exacting data standards of your photo interpretation, GIS, remote sensing, orthophotography, and planimetric and topographic mapping projects.

With more than 100 years of personnel experience and a fleet of six aircraft, we have earned a reputation for reliability by collecting aerial imagery in tight acquisition windows and getting it right the first time. We take pride in managing complex airborne projects

as a prime or subcontractor in both the public and private sectors. Our partners and clients include federal, state, and local government agencies as well as photogrammetric firms and architectural and engineering companies. We service our clientele with flight operations based in Ohio and from our remote facilities in North Carolina and Tennessee.

In 2011, Midwest Aerial became the only firm in the world to own and operate two Z/I Imaging DMC II digital mapping cameras. The DMC II enables us to make our partners and clients more competitive in the marketplace. Combined with our four RMK TOP film cameras, the DMC IIs give us unparalleled capabilities to

acquire imagery for photogrammetric mapping projects of any size, scale, or altitude.

When your mapping project requires precise imagery and reliable acquisition on a tight schedule, you need Midwest Aerial Photography on your team.

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# We Focus on Just One Thing Aerial Imaging



MIDWEST  
AERIAL  
PHOTOGRAPHY

*That's why your airborne acquisition is always our top priority.*

At Midwest Aerial Photography, we've built our reputation for reliability over the past 23 years by safely acquiring imagery when and where our clients request it. We get it done right the first time. And we will do the same for you. With six aircraft and more than 100 years of personnel experience in airborne acquisition, we know how to handle aggressive schedules, large AOI's and complicated airspace.

Our imaging capabilities are unparalleled. Midwest Aerial is the only firm in the Americas to own and operate two Z/I Imaging DMC II digital four-band camera systems. As the only large format system designed specifically for photogrammetric mapping, the DMC II has a single pixel array and rigid square frame with a fixed geometry that results in highly accurate resolution and precise acquisition at all altitudes and mapping scales.



The DMC II has emerged as the sensor of choice for private- and public-sector projects nationwide. We have deployed our DMC IIs as a prime and subcontractor for projects at all levels of government.

Whether you work with us as our client or team with us as a business partner, we will make you more competitive and successful.

Call Midwest Aerial today and learn how our unique combination of experience and technical capabilities can give you the competitive edge.



Watch the Video: [youtube.com/user/MidwestAerialPhoto](https://youtube.com/user/MidwestAerialPhoto)

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