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**Transforming Construction with Reality Capture Technologies:  
The Digital Reality of Tomorrow**

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**WEB MAPPING SYSTEM FOR VISUALIZING PAST URBAN REALITY AND  
ANALYZING ITS DEVELOPMENT HISTORY**

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**Abstract:** Historical aerial photographs of urban areas capture the reality of the urban development. This type of data provides us with a resource for studying trends in urban development, and its positive and negative impacts on today's society. A database consisting of remotely sensed images, maps and historical records allows us to understand why changes have occurred, which is important for future planning.

To examine and understand how New Brunswick (NB) municipal and provincial agencies, and federal government, shaped development for NB's major cities, we plan to (a) develop an online web mapping system that contains historical aerial images, maps and historical records of three largest cities in NB (Fredericton, Moncton, and Saint John), and (b) make this historical web mapping system available to historians and other experts for analyzing the cities' developments. However, compiling the databases containing photographic collections from early 1900s onwards can be challenging.

This presentation discusses (1) the challenges and successes in compiling a photogrammetric database for Fredericton and (2) initial findings in using the database for urban development analysis. The compiling process includes: (a) data acquisition – acquiring analogue (aerial prints) and digital imagery, (b) data processing – scanning, colour balancing, georeferencing, mosaicking, and (c) product dissemination – making database available online. This paper will discuss issues encountered with both analogue and digital collections, including missing prints, missing fiducials, radiometric distortions in prints and digital collections, effect of radiometric differences on image matching, database size versus server storage capacity, etc. This paper will then discuss the methods used to resolve the above issues and conclude with a presentation of the online historical aerial database and an example of how the database is used for urban analysis.

**Keywords:** Historical reality capture, Photogrammetry, Web mapping system, Urban development, Photogrammetric image processing.