Applying Mobile Mapping System (MMS) in GIS Applications

Michael Lau, Assistant GIS Solution Manager

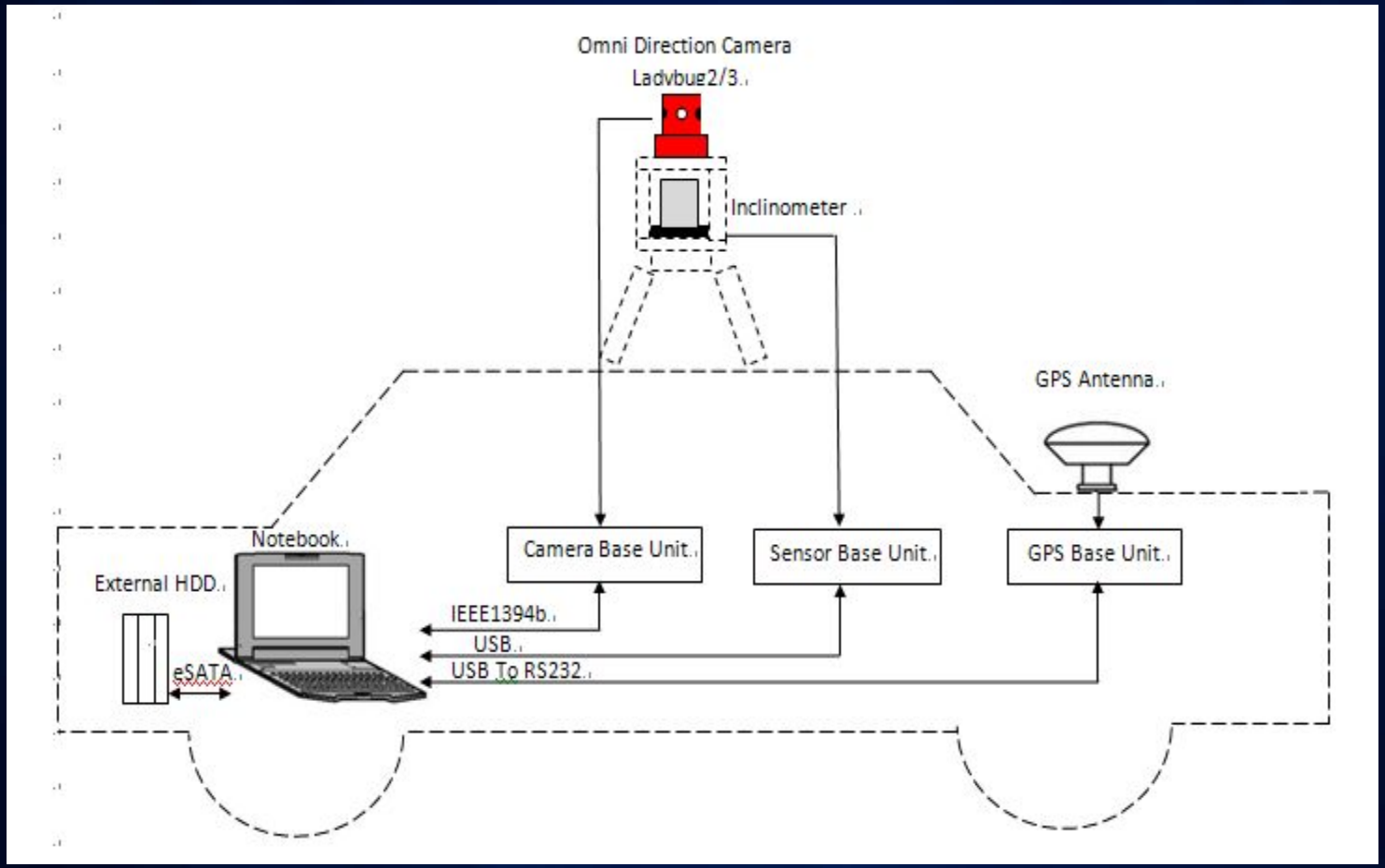
MMS Overview

- A technology to facilitate acquisition of 360˚ and high resolution Imagery based spatial data from a moving vehicle.
- Every pixel is geo-referenced with three-dimensional coordinates (X, Y, Z).

MMS Overview

- A technology to facilitate acquisition of 360˚ and high resolution Imagery based spatial data from a moving vehicle.
- Every pixel is geo-referenced with three-dimensional coordinates (X, Y, Z).

Mobile Mapping Unit



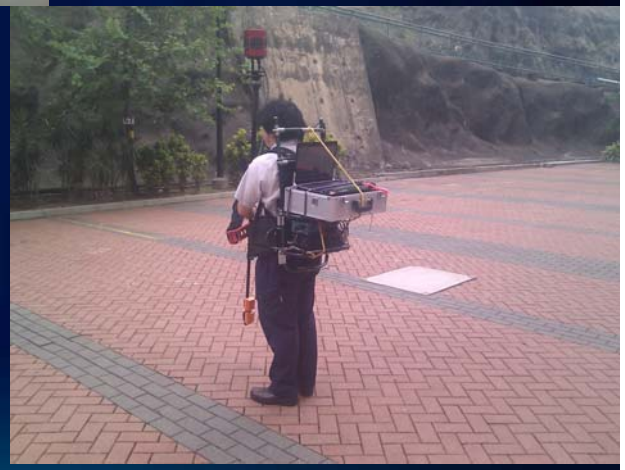
Components for the Field Shooting

Different Vehicle Options

Helicopter

Boat

Scooter



Human

System Flow

- Field Shooting

Shooting System

Shooting Software

- Data Processing

MMS Tools

Movie Making

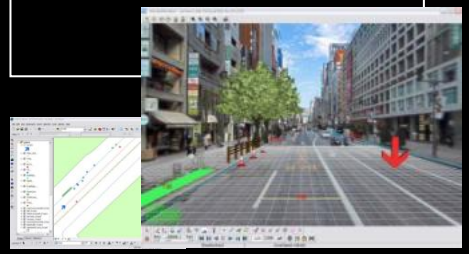
3D Analysis and Positioning

CP/Map Adjusting

Image Complementation

- Application

Desktop GIS



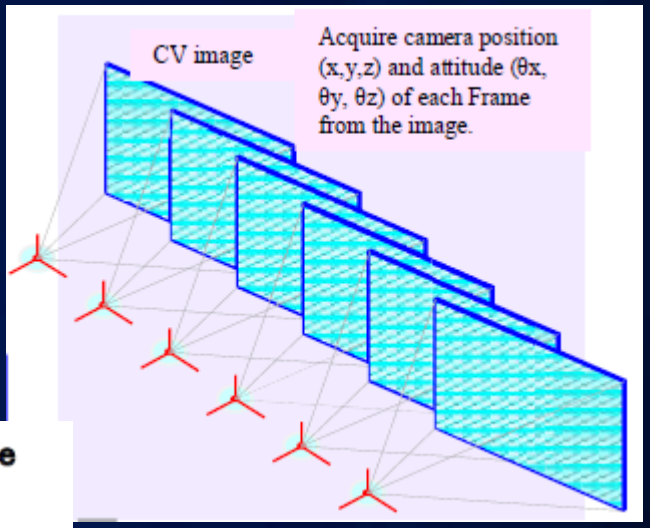
Web GIS

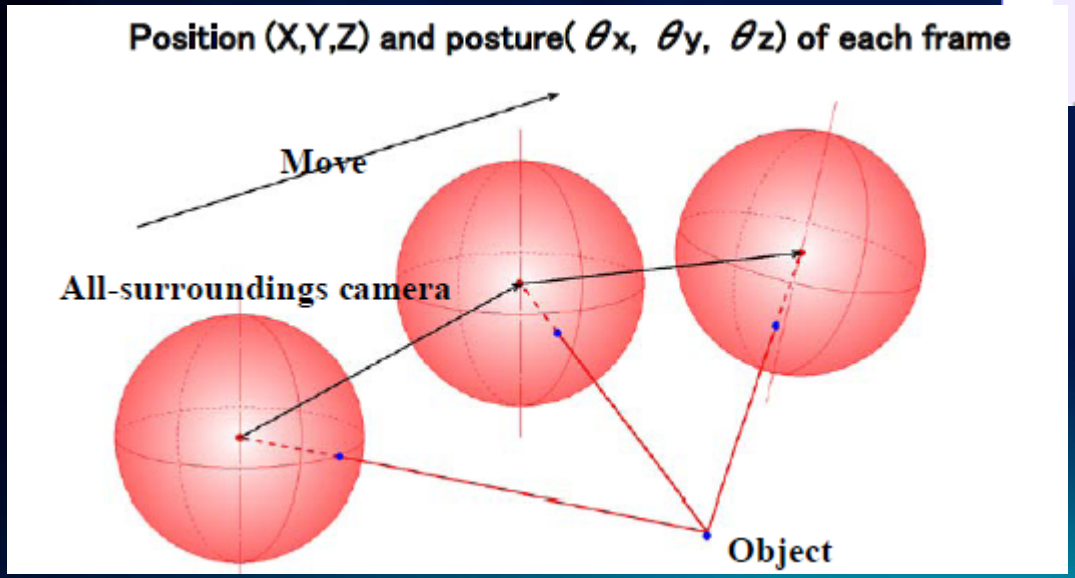
3D GIS Model

Camera Vector Technology

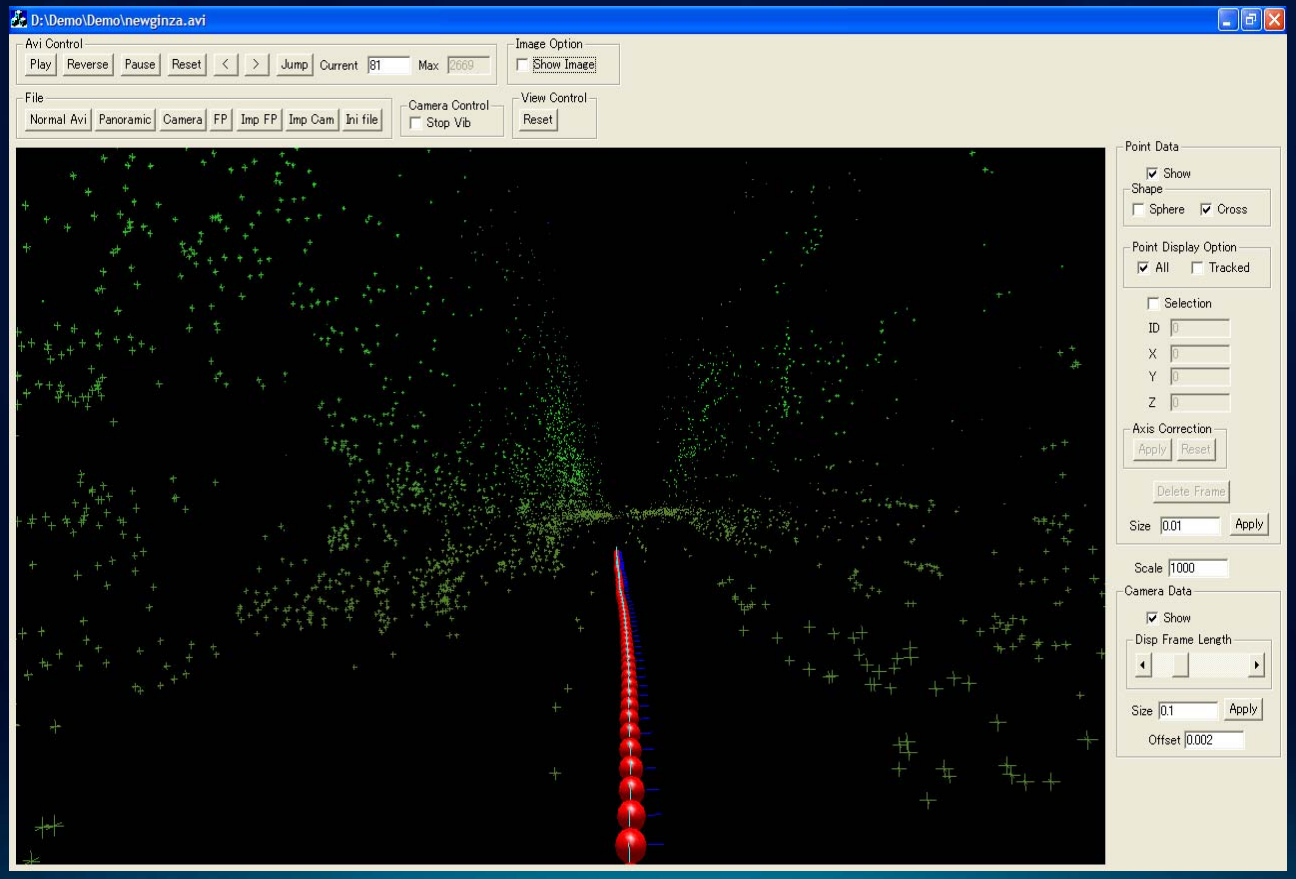
- Technology of acquisition of the camera position from the automatic, highly accurate all-surrounding video image.

- Apply mathematical analysis, based on the captured Ground Control Points, to derive the camera positions and the three-dimensional posture of each image (CV value).





Camera Vector Technology



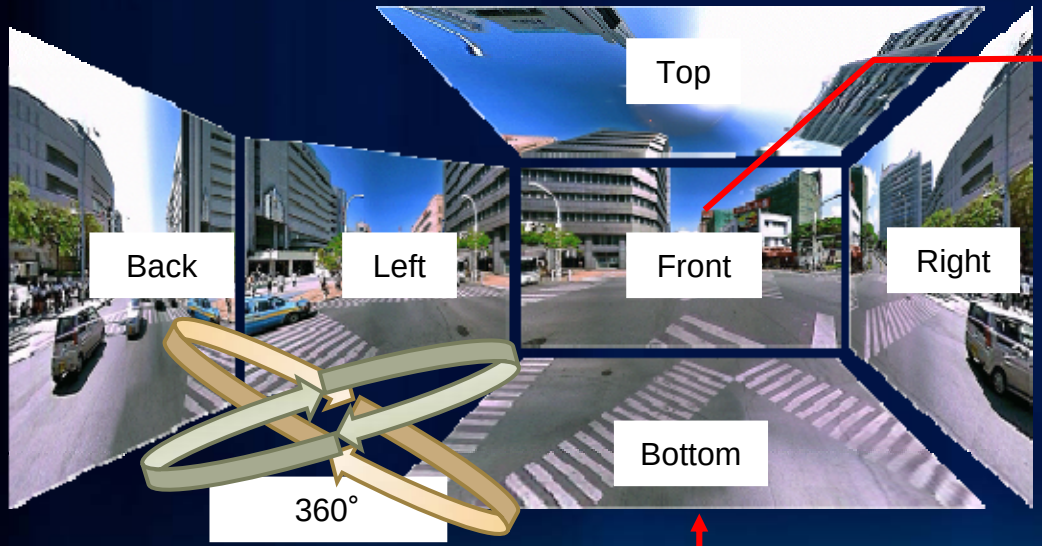
360 degree Geo-referenced Video

1) All Surrounding Complete Spherical Image

2) No Dead Angle

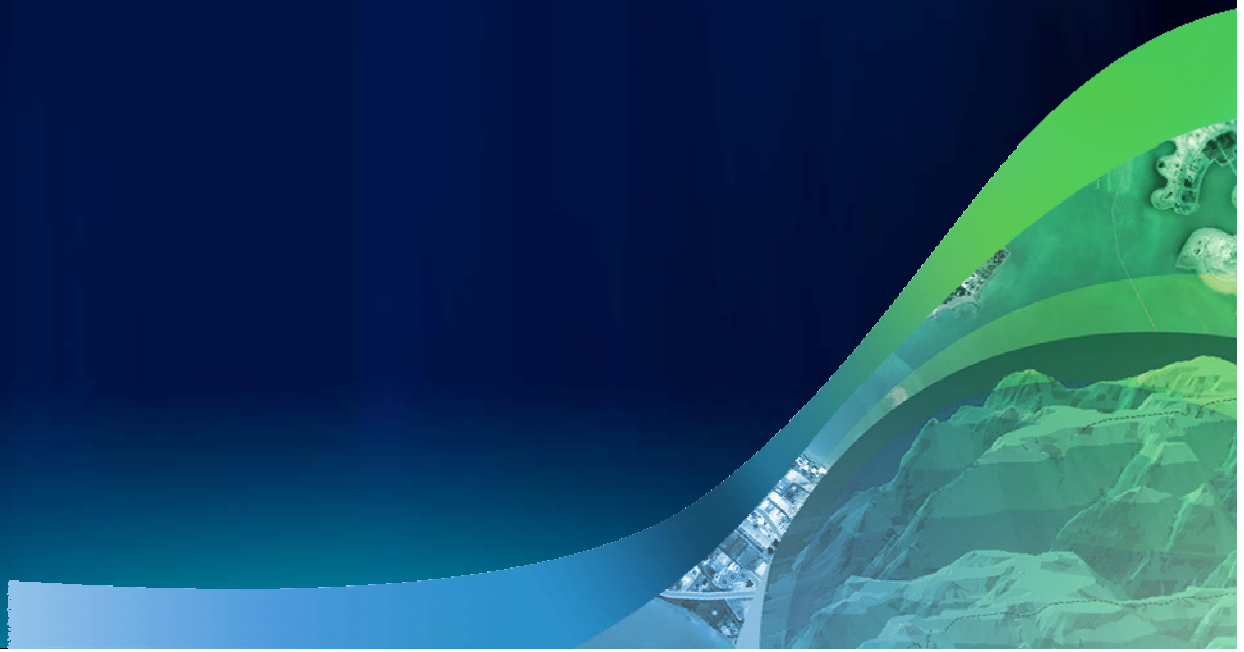
3) High density movie (Speed: 40km/h, FPS: 15-20 frames per second)

4) High resolution (2800x1400 (4mega) pixel)



Route and Current Frame

MMS Applications



3D Measurements

1) One Click Calculation of 3D Coordinate

2) Drawing the 3D Geometry (point, poly-line, polygon)

3) 3D Measurement and Area calculation

4) Intuitive 3D Grid Interface

3D Coordinate calculation

Measurement

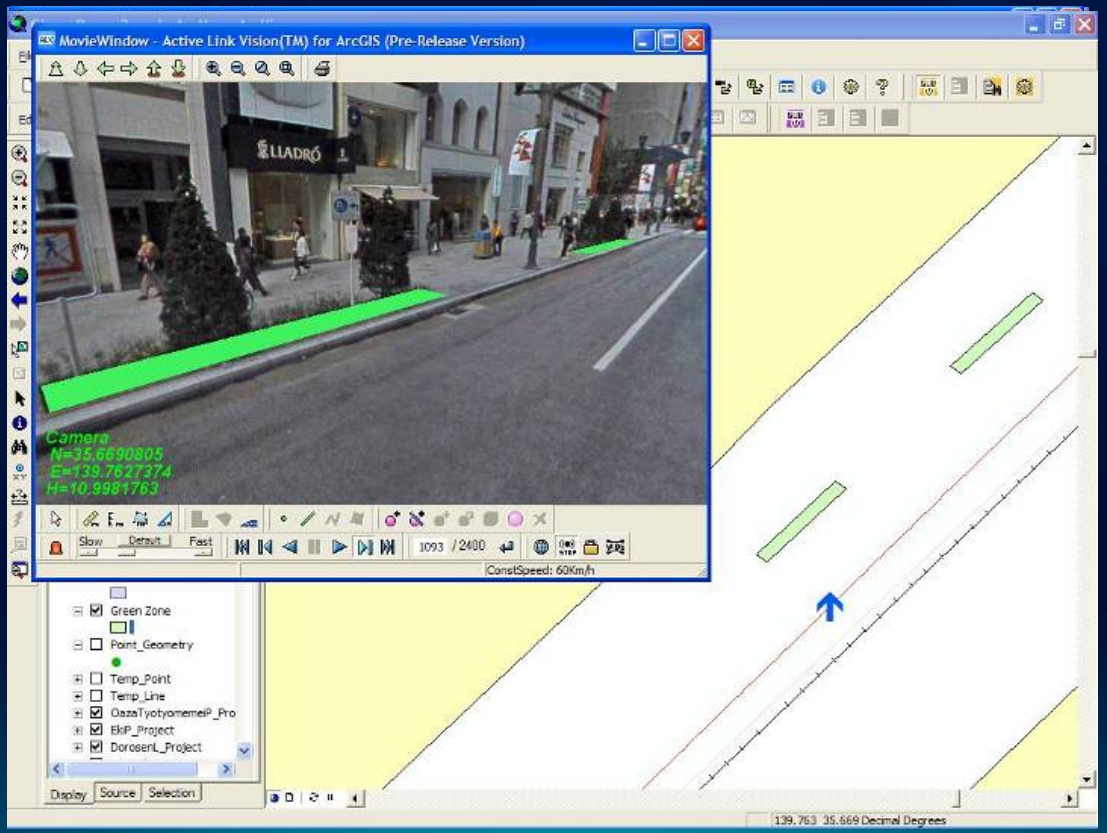
Grid Interface

Spatial Database Creation

1) Treating 3D Geo-referenced Video Imagery as a base

2) Digitize inside the Video and Reflect on the Map

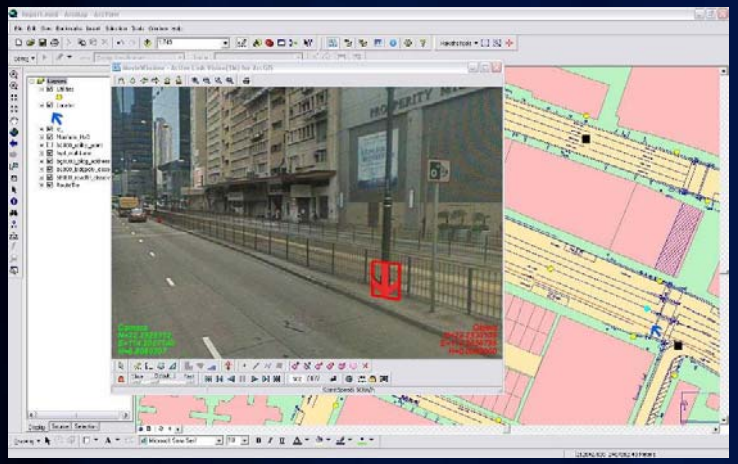
3) Support for Point , Line and Polygon Geometry

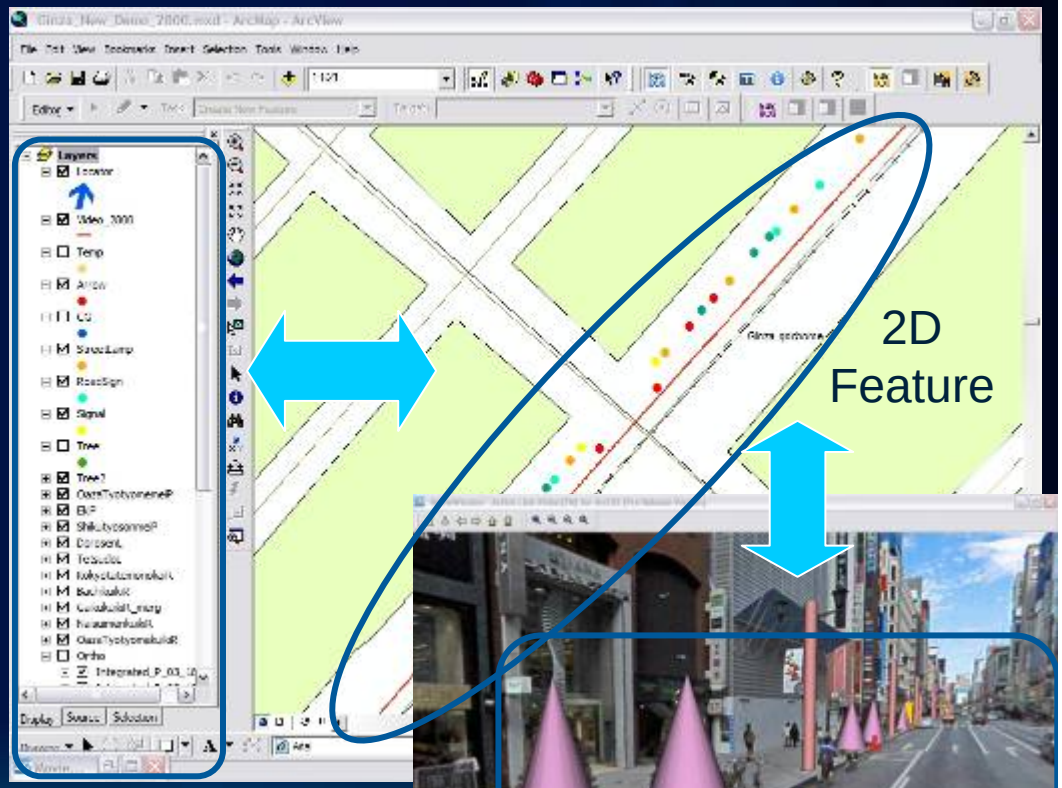


Integration with GIS

1) Import Vector data inside the Video and Visualize the data in 3D World

2) Interact between 2D map and 3D Video



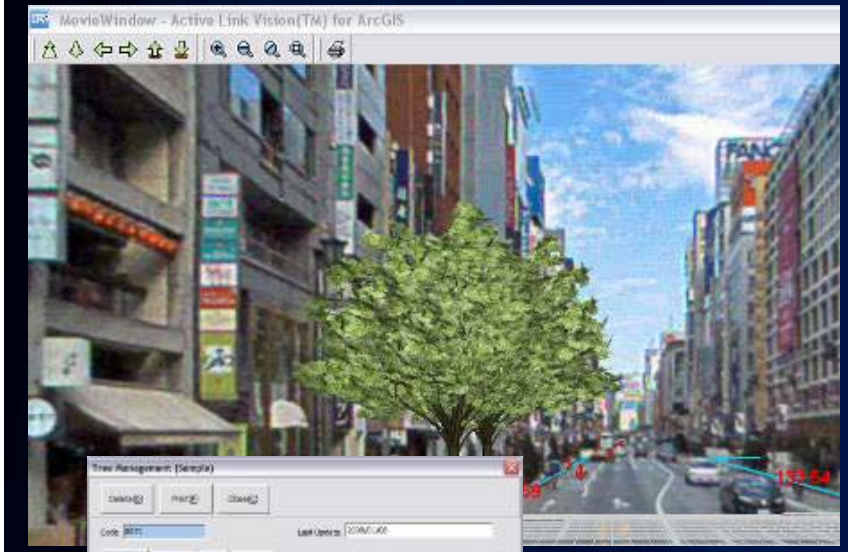


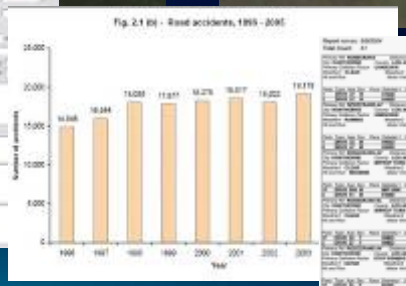
Asset Management

1) Trees Management

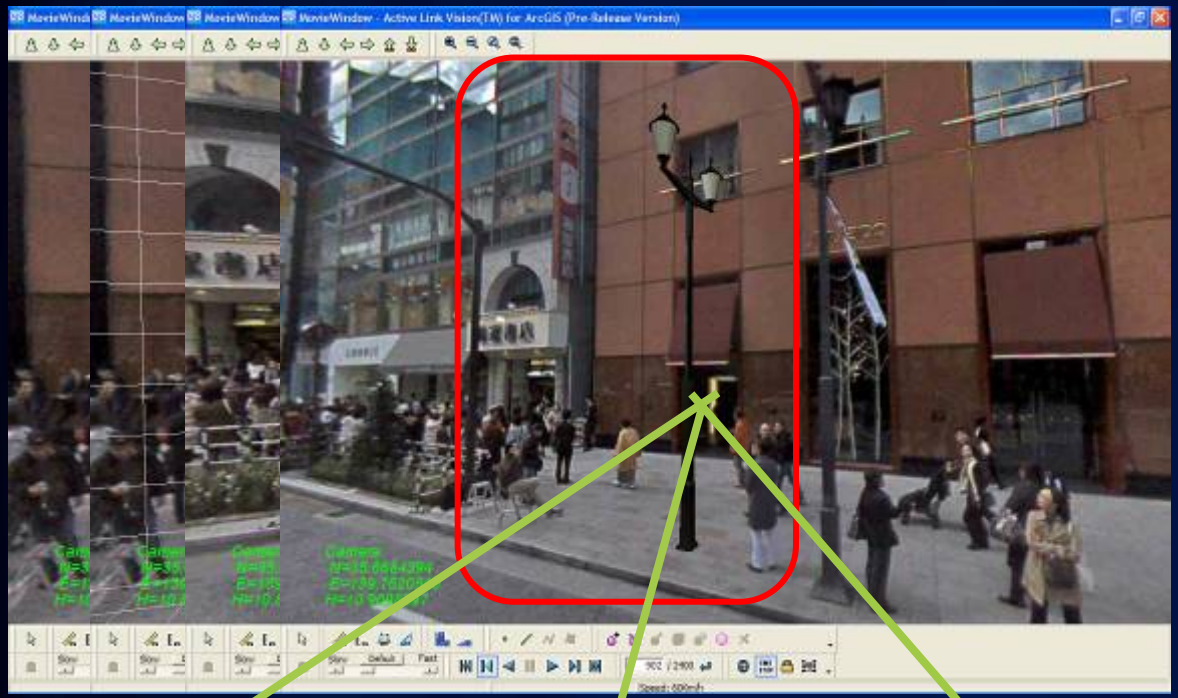
2) Road Defects Management

3) More…





Simulation and Planning



Pan

Rotate

Scale

MMS Demonstrations

esri