



## **Executive Summary**

# **AstroVision International, Inc.**

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## Executive Summary

*US\$1,000,000,000,000 annually in economic activity is subject to the whims of the atmosphere...*

*Former US Commerce Secretary Daley.*

*We don't have enough information to tell us everything about the weather as it is right this minute, and if we try to project that forward in time that imperfect knowledge translates itself into forecast errors.*

*John McGinley, NOAA Research Meteorologist*

AstroVision has developed a proprietary solution that will revolutionize the utility of weather and environmental information to those who need it the most, such as the energy, commodities, transportation and insurance industries. The Company will deliver the first live, continuous data stream and true color images of Earth at an unprecedented resolution and quality. Existing providers of atmospheric data and imagery can supply only limited, static information delayed enough to render the information useless for truly effective real-time decision-making. AstroVision's immediate, accurate, high-quality information will change all of that.

Since its formation in 1999, the Company has achieved several key milestones in pursuit of this large market opportunity. AstroVision's patented and proprietary real-time imaging system is designed and under contract for production. FCC and Department of Commerce (DOC) licenses for communications spectrum and operations are secured. The Company has signed NASA as its first high-profile customer with additional private sector customer talks underway. A non U.S. entity has licensed AstroVision's technology for another region of the world and is actively pursuing its implementation. Each member of our seasoned management team has at least 20 years experience in finance or the space and satellite industries.

## Market Need and Opportunity

An estimated 70% of U.S. economic activity is affected by atmospheric activity, providing the basis for an annual North American market for weather-related information on the order of US\$30 billion. Each year, the lack of real-time knowledge about dynamic atmospheric conditions results in an estimated US\$10 billion damage from natural disasters—damage that could have been mitigated with timely information.

Current weather and atmospheric data sources are little changed from those of two decades ago. Advances made are limited to computer-visualization software to create more attractive imagery for television viewers and enhanced predictive models to forecast the weather longer term. The most up-to-date satellite based weather data is often tens of minutes old and is sometimes several hours old. All available information is reconstructed from the same stale, static and fragmented data sources with surprisingly poor accuracy.

In the Western Hemisphere, the current choices for those organizations which need relevant truly real-time weather data are limited to delayed data sources such as:

- 1) Terrestrial based reporting stations, often hundreds of miles apart, concentrated in populated areas providing temperature, pressure and wind information approximately once per hour,
- 2) U.S. government satellites, in geostationary orbit, supplying two-dimensional temperature profile data at a rate of approximately once per hour with a resolution at best of 50 km,
- 3) U.S. government-supplied “black and white” images in the infrared and visual spectral bands at the average rate of 1 frame every 20 minutes for the U.S. (far less often for the rest of the Hemisphere) from its geostationary orbiting satellites with 1 km resolution at best, or
- 4) Color images from low Earth orbiting satellites with AstroVision-commensurate, or lower, resolution data. Due to the nature of their orbits these provide only two image passes per day over the mid- and high-latitudes and as infrequently as once per week in the tropical regions. Additionally, the data is normally delayed over two hours from time of collection before it is available to an operational user.

Current weather and atmospheric images are computer enhanced creating false color, geographic information, state lines and weather data by value added resellers. These are then sold to subscribers such as the media, Internet portals, wireless providers, utilities, airlines, commodities traders and insurance companies. Often the final images are very different from the real images and data provided by the sources such as the satellite sensors.

AstroVision will deliver the first ever, continuous data stream and live image coverage of the Earth’s atmosphere as well as other natural and man-made events with unmatched resolution and accuracy. AstroVision will provide true color images of the entire Earth as well as user selectable areas at 250 meter resolution updating once per second. Our system will deliver temperature information across the Western Hemisphere—independent of population density or ground based data collection equipment, to within one degree Celsius, at one minute intervals, at 4.5 km resolution. Our system will also provide barometric pressure over water to several millibars, at one second intervals, at 250 meter resolution.

For the first time, buyers and consumers of atmospheric information will have real-time access to what is really going on—rather than computer-generated pictures of what might be going on or what was going on yesterday.

## **Example Vertical Markets and Products**

### **Weather and Energy**

Energy companies such as Mirant, Aquila, Williams and Hydro-Québec will benefit twice as AstroVision customers. Energy (and commodity) traders will benefit from better temperature information in both the US\$11 billion market for weather derivatives as well as in the US\$300 billion power market. In addition, the energy producers and suppliers will profit from better temperature information by more efficiently managing energy assets. By more accurately forecasting demand,

based on higher resolution and more timely temperature data, one energy company projects savings on the order of US\$50-60 million per year.

#### *Temperature Volatility*

Currently, temperature readings come from more than 19,000 reporting stations with a significant number of daily report errors due to human error, equipment malfunctions or communications problems. In addition, only a relatively small number of stations in the vicinity of each metropolitan area is available to provide estimates of large-scale urban heating and cooling. AstroVision will have the capability to provide over 700,000 temperature readings over the Northern Hemisphere every minute.

#### *Hurricane Path Prediction*

Currently, all users get the same information based on government supplied data from the National Oceanic and Atmospheric Administration (NOAA) U.S. National Weather Service (NWS), a collection of airborne (Hurricane Hunters), terrestrial/ocean buoy sensors, and coastal radars for storms within 120 miles of the coast. AstroVision will deliver over 100,000 times better spatial and temporal resolution, giving our customers real-time storm location and movement. This will allow our customers to create higher probability near-term and more credible long-term storm impact predictions.

#### *Hurricane and Tropical Storm Intensity Rating Upgrades and Downgrades*

Before the NWS storm bulletins announce storm intensity changes, our customers will have unique information concerning the trend of the storm strength and direction. Because AstroVision is monitoring the storm, with updates every second, our customers can make critical decisions even before the NWS bulletins are issued.

Our energy customers will increase their market share in the energy solutions and trading businesses, as well as originate new, more precise financial instruments to create risk mitigation tools for their customers.

### **Media**

Great content is the demand of every media consumer. Great content is what differentiates one company's media offering from its competitor's offering. Internet/wireless providers must also seek unique information to flourish. AstroVision will deliver continuous live-motion imagery, in color, and in super-high resolution quality, to multiple markets for real time weather and environmental information. We are a differentiator for media/entertainment players looking to protect and grow their audience.

### **Insurance**

With unprecedented temporal and spatial resolution, AstroVision data and products will allow our insurance customers to make risk selection decisions based on precise geographic and risk profile information updated continuously. If competitors are able to make risk information available on a general area basis, our customers will be able to make information available on a more specific basis, that is, state versus county, county versus town and town versus an individual neighborhood. Whether the insurer is monitoring cumulative catastrophe exposures or partnering with clients to

model and assess the catastrophe exposures within their portfolios, AstroVision will quickly separate our insurance customers from the competition.

### **Government**

Discussions are underway with the US Department of Defense (National Geospatial-Intelligence Agency, Missile Defense Agency, U.S. Air Force and U.S. Navy). The Company has signed NASA as its first high-profile customer with additional private sector customer talks well underway.

### **Additional Vertical Markets**

AstroVision will offer breakthrough products and services in other markets (insurance, commodities trading, aviation, maritime, automotive, remote sensing and agriculture, etc.). While AstroVision will address each of these markets as the full operational status of our first satellite approaches, we are currently concentrating on the Energy, Media, Insurance and Government markets.

### **Management Team**

The AstroVision core management team consists of five people with extensive international business experience in the finance and satellite industries.

- CEO Dr. Wasaff has over 25 years of leadership in aerospace, communications, defense and information technology industries with experience ranging from leading large technical groups on through leading business development and strategic growth initiatives.
- Founder Malcolm LeCompte holds a Ph.D. in Astrophysical, Planetary and Atmospheric Sciences and with 23 years experience has managed research and development work for DoD sponsored programs for electro-optical, remote sensing technologies.
- COO Randy German has 23 years of experience in a wide range of business, government and financial specialties with over 10 years of experience in the CFO.
- VP Operations Frank Williams has 24 years of experience in all phases of aerospace development, from system conception, through funding, design and implementation and on through the maintenance and testing of systems functioning well beyond their initial design goals.
- Controller Jim Malarkey has over 30 years of experience in aerospace accounting and financial matters including 21 years at Intelsat and 9 years at Comsat.

### **Competitive Advantages**

- Licenses—AstroVision has secured an FCC license for use of 160 MHz of X-band frequency and has secured a DOC license to perform remote sensing from two geostationary orbital slots above North America and the eastern Pacific Ocean.
- Intellectual Property—AstroVision has created significant barriers to entry through two issued system patents (with others in process), market research and proprietary pricing models.
- Management and technical team—The combined staff has 150 years of experience in finance and the aerospace and satellite industries.
- Market—AstroVision is first to market with unique, comprehensive information for multiple vertical markets.

## Financial Status

The Company received US\$5 million in Series A funding in September 2000, primarily for system design, patent applications, FCC filing, and sales efforts. The Company's Series A investors were SpaceVest, the leading venture capitalist for space ventures, and CDP Technologies, the venture capital arm of La Caisse de Depot et Placement du Quebec, Canada's largest pension fund.