

## 9.0 DEFINING THE MARKET ENVIRONMENT IN THE 21<sup>ST</sup> CENTURY

### 9.1 Evolution of the e-Business Market Model

One of our tasks in this Phase I Report, to address the issue of building private sector awareness and participation in the NSDI effort, is to explore the marketing of the NSDI. After identifying the drivers of participation and usage of the NSDI, we can begin to focus on the processes and programs to support increased private sector participation in the NSDI. One of these programs will be how to market the NSDI to the private sector.

There are a number of elements that are critical to success in the “marketplace.” Marketplaces are dynamic and with the commercialization of the Internet and the speed with which technology changes, markets and channels of distribution are transforming themselves in “Internet time.” The product, and understanding the “whole product”, is important to positioning in the marketplace.

One key to successful marketing is adequate financing for marketing activities. Financing and mechanisms to provide capital for investment in infrastructure, be it bricks and mortar or information, must be considered. The FGDC has addressed financing of the NSDI in the recent report by Urban Logic, Inc., “Financing the NSDI: National Spatial Data Infrastructure – Aligning Federal and Non-Federal Investment in Spatial Data, Decision Support and Information Resources.”

Mr. Bruce Cahan, in his insightful work, “Financing the Spatial Data Infrastructure,” states, “Other than the citations herein, research has not uncovered a thorough circa-Digital Economy study (post 1998) of the market size, players and customers for Spatial Data (as distinct from Spatial Technology, hardware, software and services) supply and demand, and of the direct and indirect value of Spatial Data as part of Gross Domestic Product or other measure of the Digital Economy.”

#### This Section Addresses

- E-Business Market Model
- Market and channel segmentation – differentiating between different markets and ways to reach those markets
- Market trends from several market studies

For the NSDI to achieve its goals for private sector participation, it is essential to account for the current geospatial market and the evolution of the electronic business market model. Cahan identifies this topic as well, “Contexts for programs change all the time, but once significant private sector change is recognized, it requires an adaptive shift in emphasis and adding new mechanisms to achieve Federal goals. Recognizing and exploiting these changes in the IT landscape will accelerate development of the NSDI vision.”

The commercial remote sensing industry is having to adapt to the changing e-commerce business model. At the same time, industry participants are seeking ways to lower the up front cost for new market entrants. The need for partnering is driven in part because the spatial technologies market is highly fragmented into separate vertical markets.

To develop new markets and ultimately to capture new market share, applications and products must be offered for these individual markets. One size does not fit all. Markets as diverse as natural resources extraction, transportation, insurance, utilities, and telecommunications all require individual approaches to these vertical markets, and are typically supported by value added resellers with knowledge of the particular needs of the specific market.

<b><i>Traditional Market Model</i></b>	<b><i>E-Commerce Market Model</i></b>
<b><i>Product: Data</i></b>	Product: Information
<b><i>Satellite data only</i></b>	Multiple data sources
<b><i>Isolated</i></b>	Partnerships
<b><i>Limited pricing &amp; access</i></b>	Flexible pricing & access policies
<b><i>Knows data only</i></b>	Customer oriented
<b><i>Only collects, processes, &amp; disseminates data</i></b>	Integrated into broader GT/IT marketplace

It is essential to understand the change that is occurring in the commercial spatial technologies industry market in particular and the broader e-commerce market in general. Markets and sales drive the private sector, and the private sector will only participate where if it is in its financial interest to do so. Thus, it is incumbent upon the architects of the NSDI, given the expressed desire to have private sector participation, to understand the private sectors' drivers of participation and to motivate private sector participation within the private sector's terms of reference.

In addition to the significant growth in the geospatial technologies industry, as reported in the "State of the Space Industry" Report by the International Space Business Council, the U.S. and world economies are being transformed by the growth in the Internet. This transformation is not only monetary, and in fact, we have now seen that markets actually behave in the same old profit-seeking manner as they always have. The transformation is in the way that companies communicate with employees, customers, suppliers, distribution channels, and the media. Some of this transformation is monetary in nature. In other words, commerce over the Internet is a reality. But commerce is a small part of this transformation, and Internet commerce is really just another channel of distribution.

The number of Internet configured computers grew from 1.3 million in 1993 to

more than 93 million in 2000. The number of Americans online has grown from some 90,000 people to 137 million people today. Predictions indicate that in five years some 91 percent of the U.S. population will be online.

This online economy and community has spawned business to consumer (B2C) and business to business (B2B) e-commerce, activities, information sources, and forums. Some market research indicates B2C e-commerce could reach between \$75 billion and \$144 billion in 2003 and B2B e-commerce could reach \$3.9 trillion by 2003. By 2003, some 80 percent of all business to business transactions could occur online. Many businesses and the government are using online methods to provide information and services to businesses, consumers and citizens.

The Council for Excellence in Government recently published the results of a 14-month effort for achieving a fully electronic government in the United States. The report recommended institutional leadership changes in the Federal government's information technology management and a strategic investment fund appropriated by Congress over a five-year period. The fund would augment the existing annual appropriations of approximately \$40 billion annually to address e-government service delivery and program management.

While growth in the delivery of information and services is ongoing and increasing, so is the growth in GIS and related markets. The following Table summarizes the growth in the GPS, remote sensing, and GIS markets. The International Space Business Council projects revenue growth in excess of 20% annually increasing from \$9.6 billion in 2000 to over \$19 billion in 2004.

#### **Industry Trends – Revenue Forecast (2000 – 2004)**

	<b>2002</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>GPS Equipment &amp; Services</b>	\$7,340	\$9,159	\$11,139	\$13,320	\$14,642
<b>Remote Sensing &amp; Value Added Resellers</b>	602	1,047	1,427	2,063	2,314
<b>GIS Software, Hardware and Services</b>	1,659	1,808	1,971	2,168	2,385
<b>Totals</b>	<b>\$9,601</b>	<b>\$12,015</b>	<b>\$14,537</b>	<b>\$17,551</b>	<b>\$19,341</b>
<b>CAGR</b>		<b>25.14%</b>	<b>20.99%</b>	<b>20.74%</b>	<b>10.20%</b>

The growth in the spatial technologies industry, more than doubling over a four-year period, creates enormous demand for data. The Federal government is a major source for public domain data, and under the leadership of the Federal Geographic Data Committee (FGDC), has championed, largely through partnerships with public domain spatial data producers, the National Spatial Data Infrastructure.

Bringing the focus to the geospatial industry, a significant realization is the need to provide applications to the end-user market at low cost. To do this, many companies are rolling out integrated service offerings based on a service bureau model. One remote sensing company uses the marketing phrase “information without the infrastructure.” Thus, the paradigm shift is from the end-user having to own the hardware, software, and source the data to support enterprise requirements to a service concept being implemented through the development of application service provider (ASP) offerings. Another trend is toward Internet exchanges or portals where the infrastructure is provided, and some content is provided, but it is enriched for the visiting community through usage. The Geography Network and the VantagePoint Network are examples of this new model.

More and more companies such, as VantagePoint Network, are bundling public domain data with other commercial data and applications and providing the customer with a service solution delivered over the Internet.

We believe the NSDI, to gain private sector support, must be able to communicate a market rationale for participation in the NSDI. This can be accomplished by segmenting the end-user market into target markets – such as service providers to the agriculture sector, as in the case of VantagePoint Network. Other markets include utilities, banking, direct marketing, facility and fleet management, insurance, minerals exploration including oil and gas, redistricting services, and telecommunications to identify a few. Then, specific offerings must be tailored to meet these vertical markets.

Early adopters of technology are able to delve into broad technologies and customize them for their needs. These are the large private sector companies. The next level of company, where more companies exist, require more specialized solutions, at a lower cost of integration, in order to make their technology and data investments.

These specialized solutions require different distribution methods from the broad solutions. Integrators must take the pieces and parts of many systems, technologies and data sets to form specialized solutions. The “resell” all of these solutions and their value to their clients is in the assumption of the cost of integration. This is why they are called “value-added” resellers or VARs. These companies should be a clear target for increased private sector participation initiatives as they themselves are the catalysts for increased participation.

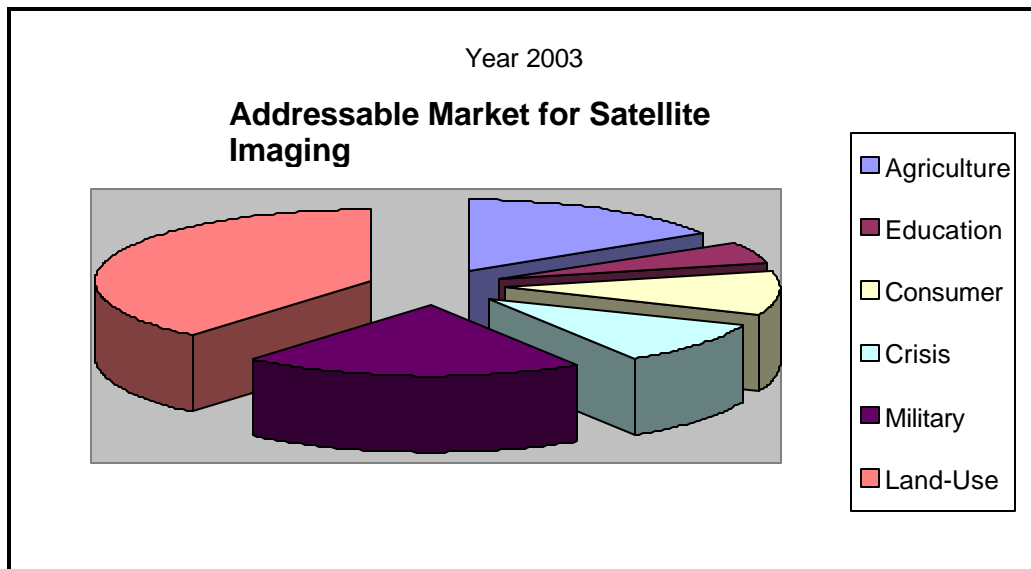
## **9.2 Merrill Lynch Study – Global Satellite Marketplace Example Vertical Market**

Merrill Lynch, in its Global Satellite Marketplace '98 Industry Outlook projected the commercial satellite industry to grow from \$39 billion in 1997 to \$171 billion in the year 2007. This 17% overall industry annual growth rate includes remote sensing imaging growth of 34.6% over the same period increasing from \$400 million in 1997 to \$6.5 billion in 2007.

With the passage of the Land Remote Sensing Policy Act of 1992 and the Presidential Decision Directive 23, the U.S. commercial remote sensing industry was created. The legislation, PDD-23 and the regulations implementing the Act and PDD-23 are intended to facilitate the development of the U.S. commercial remote sensing industry and promote the collection of widespread availability of Earth remote sensing data.

Merrill Lynch estimated the 2003 addressable market for satellite imaging to be \$2.5 billion an increase of \$900 million from 1996. This market includes:

- Agriculture/Forestry/Fishing
- Education/Media/Entertainment
- Consumer
- Crisis Management
- Military Intelligence
- Land-Use Mapping.



### 9.3 General Market Segmentation – Vertical Markets

The end-user vertical markets are the demand generators for public and private sector data, applications, hardware, systems integrators, software developers, hardware manufacturers, service providers, resellers and valued added resellers, GIS hardware, software and services companies, GPS equipment and services, remote sensing and VARS.

The Spatial Technologies Industry Association sees opportunities for the public sector to provide access to, and facilitate the use of, public domain spatial data to enable economic development, regional planning, and emergency management.

By better understanding the spatial data industry, and in particular, the end-users (vertical markets dependent on spatial data derived, in part from the public sector), the NSDI can be positioned to address its “customers’ needs” in the Federal, state & local governments, and the private sector. This customer driven approach will position the FGDC to promote the NSDI to its customers, thus increasing awareness and increasing private sector participation in developing framework themes, producing and contributing metadata, and participating in the clearinghouse process.

Productivity gains from the “new economy” are benefiting the Nation by:

- Keeping inflation and interest rates low
- Producing new employment opportunities
- Enabling unprecedented economic growth that has significantly reduced the Federal budget deficit and its drag on our economy.

Many old business practices are being abandoned in every industry sector - auto manufacturing, transportation, retailing, oil and minerals exploration. Productivity gains are being realized as companies in these industries harness technology and information.

New distribution channels are being created. New business-to-business (B2B) relationships are being established, dependent upon e-commerce technologies, and new retailing methods are serving consumers directly. These emerging business processes are applicable to the public sector and offer the prospect of significant productivity gains in the administration and conduct of public sector functions.

Data is an essential element of the new e-commerce economy and spatial data is an increasingly key data element for decision support systems in all sectors of the economy.

This is where the public sector plays such a significant role. The public sector is a major producer and user of spatial data; thus it is a significant stakeholder with an important role ensuring that the marketplace functions efficiently. The Federal Geographic Data Committee (FGDC) recognized early-on, the duplication of data collection among Federal departments and agencies costing millions of dollars, is a case of the right hand not knowing what the left hand is doing.

Ideally, data must be made available quickly (real-time preferably) and it must be easily accessible. Where the public sector owns the data, it is responsible for its timely and efficient distribution.

The convergence of communications technologies, data and information availability from both private and public sources, and systems and applications capable of assimilating this information for decision making, demands the public sector redefine its information technology systems to support Congressionally legislated Federal agency missions.

Just as the Department of Defense deploys the latest "smart weapons" for our nation's defense, Federal civilian agencies must deploy e-commerce technologies to its programs. Agencies involved in major public purposes include:

- Property rights - Department of the Interior, Bureau of Land Management
- Voting rights - Department of Justice, State Legislatures
- Revenues from property ownership - BLM, Department of Agriculture, U.S. Forest Service
- Transportation, Navigation, and Commerce - Department of Transportation, U.S. Army Corps of Engineers, Department of Commerce, National Ocean Service
- Public Land, Minerals, and Marine Sanctuary Management – Department of the Interior
- Agriculture and Natural Resource Development – Department of Agriculture
- Environmental Protection and Ecosystem Management - Environmental Protection Agency
- Community and Economic Development - Department of Housing and Urban Development, Veterans Administration, Small Business Administration and the Department of Energy
- Emergency Management - FEMA

- Public Safety
- Public Information - Department of Labor (employment statistics, Department of Commerce (trade statistics))

Federal agencies must be capable of delivering data, information, and knowledge within the technological framework of the 21<sup>st</sup> century's "communication age." Spatial information collected and used by 17 Federal departments and agencies is essential to the public purposes and decision support systems significantly impacting literally thousands of activities contributing to the Nation's economic growth.

#### 9.4 Channels Segmentation

As the spatial technologies markets have both grown in size and segmented into smaller vertical markets, core spatial technologies companies have tended to leverage their resources through partnerships with application developers, value added resellers, systems integrators, and hardware vendors. The spatial technologies markets can be segmented many ways along end-user demands. Of importance to our effort with regard to the NSDI is to understand the evolving channels strategies the spatial technologies companies are adopting to reach vertical markets.

There are a number of distribution channels applicable to the spatial technologies market including:

- **Direct Sales** – A direct sales channel is typically national in scope and focused on calling on major accounts, this consists of a dedicated sales force directly employed by the vendor. This channel strategy fits for high-end products requiring specific knowledge of the customer and is characterized by longer sales cycles selling high-cost solutions.
- **Retail Sales** – Retail sales channels are typified by a two-tiered distribution channel consisting of master distributors supplying retail outlets that deal directly with end-users.
- **Industrial Distributors** – This typically is the channel for commodity industrial component parts to the semiconductor industry and other computer related equipment suppliers. These distributors are large in size and have very low margins.
- **VARs** (value added resellers) – The VAR channel is typically a two-tiered channel, where VARs source hardware and software and other solution components, including proprietary software, into a complete, application specific product or solution for the customer.



- **OEMs** (Original Equipment Manufacturers) – This channel structure includes direct sales selling to manufacturers who integrate the purchased product into their own systems and sell the systems on to the customer.
- **Systems Integrators** – While SI's tend to develop specialized solutions for an end-user, often these custom solutions can be replicated to other vertical markets.

## 9.5 “Marketing 101”

Clearly, all of the above channels have applicability to the NSDI however, the VAR channel may well offer the greatest opportunities to promote awareness of the NSDI and increase participation by private sector companies.

Two threads characterize all of these channels. The first is that they are all selling products and/or services. The second is that they all can benefit from electronic means of supply chain automation. Both of these threads are important to consider when setting marketing strategies for increased participation. These marketing strategies must:

- Suggest that participation helps these companies generate revenue.
- Show that working with the NSDI is modern, easy, and a facilitator to time-to-market issues.

We also know that many other issues are of concern to private sector companies. For this reason, marketing materials, campaigns, and strategies must be able to address the following topics:

- Data integrity or accuracy
- Data security and the protection of intellectual property
- Data resolution options
- Reduced costs or increased profitability through participation in the NSDI

Marketing campaigns or initiatives do not have to be flashy or of high cost. As long as the right message can be delivered to the right audience, with the products or services to back up the messaging, any marketing program, now matter how expensive or inexpensive, can be effective.

Trade shows have grown to be increasingly ineffective. Companies spend a significant amount of their marketing budgets with very little return with respect to sales or increased brand awareness.

Advertising is a great vehicle to increase brand awareness, but it is often misused as a tool. For advertising to work, the message must be presented frequently and consistently over a period of time. Most advertising campaigns focus more on the message and how “trendy” it is and forget to budget for the frequency of the message. Frequency, the most important factor in advertising success, is expensive.

Direct mail often fails for two reasons. Firstly, companies send direct mail to purchased lists of companies, that may or may not have an interest in their wares. These lists are often outdated, especially if only purchased or leased once per year. Most lists lose 15% of their accuracy each month. Secondly, direct mail is used so often now as to be rendered ineffective. So many pieces hit the desks of executives and consumers each day as to be difficult to differentiate. Most direct mail pieces end up in trash bins before they are read. There are two exceptions to these trends. When lists are “pre-screened” for accuracy, and targeted to go to the right people in the right companies, they are more effective. Also, when direct mail is coupled by telephone follow-up campaigns, it can be very effective.

Another new method is the email campaign. The term “permission-based marketing” suggests that email campaigns require a great deal of research before the email messages can be sent. As with direct mail, the email lists must be pre-screened for accuracy and the appropriate targets. They are also more effective with telephone follow-up. But a significant distinction exists. Email should only be sent to those who have provided permission for advertisers and marketers to use their email accounts as a vehicle for message delivery. This requires a secondary level of pre-screening for success.

Other marketing tools are essential for the delivery of a complex message that is contained in the NSDI. Some of these tools are:

- Success stories by vertical market including ROI or return on investment analyses.
- White papers describing the applications of information and technologies.
- Seminar programs to describe, in detail, the use of and issues surrounding data and technology.
- Articles, placed in appropriate journals, touting the successful use of NSDI components.
- Participation in industry associations and forums.
- Lobbying efforts to increase awareness for legislation and funding. Lobbying efforts can be to governmental bodies or funding sources.

- The use of industry luminaries to spread the word through speeches, articles, books, interviews, press conferences, and press tours.

As we build suggestions to increase awareness, we will incorporate many of these marketing concepts.