



# FEMA

FEMA 411  
July 2002

# HAZUS Market Characterization Study

HAZUS is your natural hazard loss estimation methodology

PB2003-101243



EARTHQUAKE



WIND



FLOOD



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# Acronyms

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ASFPM	Association of State Floodplain Managers
BAHUG	Bay Area HAZUS User Group
BLS	U.S. Bureau of Labor Statistics
CMSA	Consolidated Metropolitan Statistical Area
CRS	Community Rating System
DMA	Disaster Mitigation Act
DoD	U.S. Department of Defense
EMI	Emergency Management Institute
GIS	Geographic Information System
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
HAZUS	Hazards U.S.
HMGF	Hazard Mitigation Grant Program
MH	Multi-Hazard
MSA	Metropolitan Statistical Area
NETI	FEMA Emergency Management Training Institute
NFIP	National Flood Insurance Program
NIBS	National Institute of Building Sciences
NFIRA	National Flood Insurance Reform Act of 1994
OES	Occupational Employment Statistics
OMB	Office of Management and Budget
PMSA	Primary Metropolitan Statistical Area
ROI	Return on investment
SIC	Standard Industry Classification
SOC	Standard Occupational Classification
Tetra Tech	Tetra Tech EM Inc.
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey







# Section 1: Background, Findings, and Recommendations

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## ***Background***

The mission of the Federal Emergency Management Agency (FEMA) is to reduce loss of life and property and protect our nation's built environment from a full range of hazards. To support that mission, FEMA has created a risk-based management tool called Hazards U.S. (HAZUS). FEMA developed HAZUS in cooperation with the National Institute of Building Sciences (NIBS), as a nationwide, standardized computer-based tool to assist in planning for and estimating costs due to earthquakes. HAZUS was developed in response to the need for more effective national, state, and community-level planning through an enhanced ability to identify areas that present the highest risk and potential for loss.

Currently, HAZUS supports FEMA's key activities related to mitigation of, preparedness for, response to, and recovery from earthquake hazards. FEMA distributes HAZUS to any user free-of-charge. In addition, FEMA provides training and technical support to inform users of the features and benefits of using HAZUS at the community level. HAZUS has been expanded to include two new modules for flood and wind hazards. The flood module, which will address flood hazards in riverine and coastal areas, currently is being field-tested. By February 2003, HAZUS Multi-Hazard (MH) will be released. HAZUS MH will include the previously released earthquake and flood modules as well as a wind module that will estimate potential losses from wind (e.g., hurricanes, tropical cyclones, thunderstorms, and hail).

Tetra Tech EM Inc., under contract with FEMA, conducted this market characterization study because of the expansion of HAZUS' capabilities and the growing need for planning for multi-hazard disaster mitigation. Figure 1-1 documents the marketing study sources, outputs, and findings. FEMA anticipates that the enhanced capabilities of HAZUS MH will rapidly increase the already growing number of HAZUS users. That rise in new users and the potential to penetrate new markets is expected to increase the need for additional training and technical support. Therefore, planning is required to determine where potential users are located and to evaluate future needs for technical and training support.

The study was designed to provide external, or "market pull", and internal, or "market push", analysis to better understand current and potential HAZUS users and their requirements and to provide a methodology and planning tool for developing training and projections for technical support. Market pull provides information to FEMA regarding what users need to achieve their missions. Market push provides information to FEMA regarding actions that can be taken internally (within FEMA Headquarters and in its regional offices) to increase demand for HAZUS MH and support its distribution. The market study considers both existing (earthquake) and evolving (wind and flood) HAZUS MH capabilities for estimating losses from disasters. The findings of the market study will provide the basis for the formation of a HAZUS MH marketing strategy.



Figure 1-1: MARKET STUDY INFORMATION SOURCES, OUTPUTS, AND FINDINGS

HAZUS Users Database	User Input	Framework	Outcome/ Results	Findings
<p>Compiled for market study from data on past HAZUS training and data on distribution of HAZUS by FEMA</p> <p>Data analyzed by:</p> <ul style="list-style-type: none"> <li>• User Role</li> <li>• Organization</li> <li>• Geography</li> </ul>	<p>Collected information about HAZUS awareness, satisfaction, complements, training and technical support needs</p> <p><b>User input obtained from:</b></p> <ul style="list-style-type: none"> <li>• Federal Government</li> <li>- FEMA</li> <li>- Non-FEMA</li> <li>• State Government</li> <li>• Local Government</li> <li>• Other Government</li> <li>• Private Sector</li> <li>• Academia</li> </ul> <p><b>Data analyzed by:</b></p> <ul style="list-style-type: none"> <li>• Role</li> <li>• Organization</li> <li>• Geography</li> </ul> <p><b>Provides insight regarding Four Ps:</b></p> <ul style="list-style-type: none"> <li>• Product</li> <li>• Price</li> <li>• Place</li> <li>• Promotion</li> </ul>	<p><b>Role:</b></p> <ul style="list-style-type: none"> <li>• Data Enhancer</li> <li>• Operator of Software</li> <li>• Engineer or Consultant</li> <li>• Risk Manager</li> <li>• Leader/Decision Maker</li> <li>• Earthquake/ Floodplain</li> <li>• Wind Manager</li> </ul> <p><b>Organization:</b></p> <ul style="list-style-type: none"> <li>• Market Segments</li> <li>• Specific Organizations</li> </ul> <p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>• CMSA, MSA, PSA</li> <li>• FEMA Regions</li> <li>• High Risk Areas</li> </ul>	<p><b>Role:</b></p> <ul style="list-style-type: none"> <li>• Target individuals with skills required to optimally use HAZUS</li> <li>• Determine proper mix of skills</li> </ul> <p><b>Organization:</b></p> <ul style="list-style-type: none"> <li>• Target Key organizations deemed important by FEMA in terms of customers with unmet, existing, or potential needs</li> </ul> <p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>• Target locations by high density areas (CMSA, MSA) combined with high risk</li> <li>• Apply priority hazard to locations - single or multi-hazard</li> </ul>	<p><b>Role:</b></p> <ul style="list-style-type: none"> <li>• Invest in individuals who have skills that may currently be underutilized</li> <li>• Determine by organization and geographic area optional mix of roles that FEMA wants</li> <li>• Target by user role outreach and/or training and technical support</li> </ul> <p><b>Organization:</b></p> <ul style="list-style-type: none"> <li>• Invest in high priority users with needs that may be currently unmet</li> <li>• Target organizations that may be future partners for HAZUS user groups and potential training organizations for FEMA</li> <li>• Evaluate complements to HAZUS for potential partnering with organizations</li> </ul> <p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>• Invest in training for FEMA regions with high density populations</li> <li>• Focus on high density populations that overlap with high risk areas</li> <li>• Evaluate market drivers that impact specific areas</li> </ul>
<p><b>Identified Market Segments</b></p>				
<ul style="list-style-type: none"> <li>• Federal Government</li> <li>• FEMA</li> <li>• Federal Government non-FEMA</li> <li>• State Government</li> <li>• Local Government</li> <li>• Other government/ International</li> <li>• Private Sector/Non-profit</li> <li>• Academia</li> <li>• Private Citizen</li> </ul>				



## **Scope**

This section presents the background and purpose of this marketing study, including the major findings and recommendations resulting from their study. The remaining sections of this market characterization study report include:

**Section 2** – Approach and Definition of Concepts – describes the approach for the market study and presents basic marketing concepts.

**Section 3** – The Current Market – presents data about the current HAZUS market. It includes an overview of the past and existing market status. It also provides insights regarding the status of training and technical support based on available information. This available information includes: data derived from a NIBS study, information about distribution and training for HAZUS, and input obtained from potential and existing users.

**Section 4** – The Future Market – applies the conceptual approach of the market study in an evaluation of the future market for HAZUS MH. It includes an analysis of the potential universe of users based on Bureau of Labor Statistics and U.S. Census data. It also describes market drivers that are expected to increase the demand for HAZUS MH. Finally, the section provides insights about the future market within the Four P framework, based on input from various market segments.

## **Major Findings and Recommendations**

A more detailed explanation of these findings is located in Sections 3 and 4. Major findings and recommendations include:

- An analysis of the potential effect of market pull and market push scenarios
- Insights provided by various user tiers defined by their roles, user organizations, and user geography
- Top five findings from the HAZUS market study presented within the framework of the Four Ps of Marketing (Product, Price, Place, and Promotion)
- Recommendations relating to training and technical support
- Findings regarding future needs and directions
- Recommendations regarding next steps

### **Analysis of Market Pull and Market Pull/Market Push Scenarios**

The two scenarios that could impact the number of potential users that become actual users of HAZUS by 2008 are: (1) market pull, and (2) market pull combined with market push.

Market pull is defined as the natural growth in the economy combined with market drivers discussed in depth in Section 4 of this report operating on their own or with existing levels of



FEMA resources and involvement. The existing five market drivers include such factors as: (1) releasing HAZUS as a multi-hazard tool, (2) the impact of the Disaster Mitigation Act (DMA) 2000, (3) the formation of HAZUS user groups, (4) training and technical support, and (5) a general increase in awareness of the importance of pre- and post-mitigation planning. The potential HAZUS market is increasing naturally over time. Market pull items are considered to include natural growth in the economy and current information and efforts regarding HAZUS.

The market pull scenario will affect the number of actual users within the potential user universe. For the purposes of this study, it is estimated that if FEMA continues to operate and implement HAZUS as it does currently and the market drivers have some effect, the potential population of HAZUS actual users could reach a level of 25 percent of the potential users by 2008, or 19,619 actual users out of the estimated 78,477 potential users by 2008. Assuming that current market pull conditions and additional elements of market push will increase the number of users to increase at a rate comparable to recent HAZUS user increases, an annual 10 percent growth in users through 2008 would result in 72,994 users of the 78,477 potential users.

### ***Insights Provided by Various User Tiers***

The following discussion presents the insights gained regarding users of HAZUS, by the three tiers of users — user roles (Tier 1), user organizations (Tier 2), and user geography (Tier 3) — identified in Section 2, Approach and Definition of Concepts.

#### ***Tier 1: Users Roles***

- FEMA should continue to encourage and support the formation of HAZUS Users Groups (for definitions, refer to page 46) as a way of targeting additional users working in a variety of roles needed to support better data results.
- FEMA should insure that sufficient Geographic Information System (GIS) data enhancers are available in FEMA's strategic targeted markets and geographical locations. These persons can help apply the HAZUS software at the local level.
- FEMA should continue to identify and evaluate the individuals being trained on HAZUS to ensure a mix of trainees that fall within various HAZUS users roles.
- FEMA should consider encouraging or targeting more risk managers and decision-makers to take HAZUS training.

#### ***Tier 2: User Organizations***

- State and local organizations were well represented in the past market for HAZUS and will continue to be an important target for HAZUS.
- Other federal agencies and representatives of state and local organizations, and private citizens indicated that the flood module would likely encourage them to use HAZUS.
- FEMA's input into the data collection efforts indicated that the HAZUS system is valuable and will be useful to state and local users.



- Some state and local users stated they had found HAZUS to be cumbersome and resource intensive; nonetheless, several states reported using HAZUS.

### ***Tier 3: User Geography***

- Substantial geographic diversity exists in the user population for the past and current market for HAZUS.
- Some areas of concentration and penetration, such as earthquake-prone states and population centers (consolidated metropolitan statistical areas [CMSA] and metropolitan statistical areas [MSA]). State respondents from smaller metropolitan areas do not see the value of HAZUS to their needs because it appears to be geared to more highly populated areas and the default data aligns in that manner.
- Users had indicated that more localized data to supplement default regional data would be useful.
- Based on the analysis of data aggregated by Standard Industry Classification (SIC) and Standard Occupational Classification (SOC) designated occupational categories are well represented across the states and regions.
- Geographic diversity of users will facilitate the formation of HAZUS User Groups.

### ***Top Five Findings from HAZUS by the Four Ps of Marketing***

The top findings from the market study are summarized below in the context of the Four Ps of Marketing.

#### ***Product: Technical Strengths of HAZUS***

Several respondents from both data collection efforts had identified HAZUS as being user-friendly, although this response primarily is limited to existing users. Potential users, or users with limited experience such as those who have had training only stated they found HAZUS to be a powerful software tool; however, some respondents had described HAZUS as complicated (a response that was dependant their level of expertise). Also, users in most market segments had identified similar positive comments about the technical features of HAZUS, such as its open architecture, its ability to integrate multiple databases, its usefulness as a management tool that supports their jobs, and as a valuable application for GIS applications.

#### ***Product: Technical Opportunities for Improvements to HAZUS***

Factors described by potential users as important to the use of a tool like HAZUS to mitigate risks include:

- Timeliness of the product
- Its ability to integrate with existing GIS software
- Its ability to address a variety of risks
- The user's understanding of information inputs and outputs



- The tool's ease of use
- Available training for the tool
- The availability of economic data

In addition, existing and potential users had reported that they are waiting for additional features (for example, the flood and wind modules) because data collection and training investments would be easier to justify, as HAZUS becomes a multi-hazard tool. The flood module was cited most often as a module that would be useful.

### ***Price: Market Cost of HAZUS***

The NIBS study indicated that lack of funding for implementation and the availability of inadequate computer equipment and software had caused barriers to effective use of HAZUS. Input from FEMA regional representatives had appeared to confirm this statement. They added that a lack of funding for training also might be a barrier. Those barriers are indirect costs, as they do not represent a direct cost to obtain the software but rather are costs that are associated with preparing to use and using the software. Because of the indirect nature of those costs, they might be less visible to FEMA HQ personnel who are distributing the software, but for some potential users, present real barriers.

### ***Placement: Where HAZUS is Located in the Market***

Respondents to the data collection effort were geographically dispersed in pattern similar to the distribution of HAZUS users, with a large number of existing and potential users from earthquake prone areas. Respondents matching user and market segment categories identified in Section 3 of this report were uniform across the states and FEMA Regions.

### ***Promotion: Promotion of HAZUS in the Market***

For the data collection effort associated with the market study, FEMA input focused on the perceived value of HAZUS to the state mitigation programs. State and local respondents had appeared to appreciate the potential value of HAZUS, but noted that its usefulness would be enhanced by additional management support, information about the benefits of using HAZUS, technical capabilities, and expanded training through online case studies and localized training.

### ***Highlights Related to Training and Technical Support***

Detailed comments about training and technical support are included in Sections 3 and 4 of this report. The following is a summary of needs and suggestions identified by users for enhancing training and technical support.

#### ***Training and Technical Support Recommendations***

- Provide more frequent training and, preferably, local training in high population density, high-risk areas. In addition, those areas with large population and a high probability for events modeled in HAZUS likely would be strong demand centers for HAZUS.
- Offer different types of training for different types of HAZUS users (that is, tailor training offerings by market segment or user role).



- Distribute HAZUS software online or through a computer network – respondents noted the current distribution channel is expensive and considered to be one that does not allow quick and easy access to HAZUS.
- Consider conducting four-day training that provides hands-on learning, uses more trainers, and is offered at a slower more in-depth pace.
- Consider providing free online training; this was considered a high priority for private sector representatives such as consultants that would not normally be able to set aside a few days for training.
- Incorporate in future training efforts, examples of hazards specific to fire departments or other multi-hazard analyses.
- Provide examples of case studies targeted to local communities as well as how-to guides for data collection, because local data collection efforts appear to be a significant issue for state and local respondents.
- Maintain an accurate list of all individuals trained in HAZUS through Tetra Tech EM Inc. (Tetra Tech), HAZUS User Groups, and other organizations, and make the list available on the Internet to FEMA regional offices and other interested parties.
- Compile a mailing list or an e-mail distribution list of emergency managers and planners (or other FEMA target groups) and use this list to help remind these potential and existing users of the benefits of HAZUS, opportunities for pilot projects, and upcoming training courses.
- Ensure that HAZUS is compatible with other databases and software platforms used by potential and existing users.
- Secure a commitment from FEMA management to formally integrate HAZUS MH into agency functions as well as seek ways to integrate the use of HAZUS MH across divisions within FEMA and its regional offices. State and local level efforts in the development of disaster plans also can be greatly enhanced through HAZUS. However, there must be an assurance that training support is available. Technical endorsement of HAZUS MH inputs and outputs as a mechanism for developing accurate, consistent, and acceptable disaster plans likely will enhance its use among communities and other such users.
- Technical support (through a toll free number and e-mail) appears to be useful to persons who attend training. However, awareness of the technical support opportunities for potential users or those who have not received training might present an opportunity for additional communication.

***Recommendations for Continual Improvement of HAZUS Training***

- Reevaluate the HAZUS training program and tailor it to the needs of an increasingly diverse and evolving set of potential and existing users. Training approaches also need to accommodate the desire of potential HAZUS users to travel less and reduce the time they are out of the office; this may require local training venues. Such venues could be set up to align specific hazards of concern to users by geography (Tier 3).



- Increase private sector involvement in providing HAZUS training by developing a registry of HAZUS-authorized vendors that will provide fee-based training services to HAZUS users.
- Target the basic HAZUS training course offered at Emergency Management Institute (EMI) to those who have GIS expertise, and offer slightly modified courses to other users in other roles (for example, decision makers, risk managers, and others). These modifications likely could be made to the existing basic training course to control development costs.
- Compile a compendium of stand-alone training classes (ranging from Earthquake or Cartography 101 to advanced data interpretation) and offer tutorials, case studies, online chat rooms, and courses that can address the needs of a range of potential and existing users and other tools to provide real-world testimonials about the utility of HAZUS.
- Revise the process for evaluating FEMA training courses to gather more useful feedback over time, and develop mechanisms by which to follow up with trainees to reinforce course content and to identify areas where further training or technical support would be helpful.
- Follow up with HAZUS trainees to evaluate whether they are using the system, and if not, identify the obstacles they have encountered.

### ***Recommendations for Continual Improvement of Technical Support***

- Consider offering distinct levels of technical support that would target two user groups: novice HAZUS users and advanced HAZUS users. Given the wide range of background knowledge and experience among HAZUS users, FEMA should provide information and support in a manner that can best help varied users succeed.
- Increase private sector involvement in providing HAZUS technical support by developing a registry of HAZUS-authorized vendors that will provide fee-based training services to HAZUS users.
- Provide technical support that addresses the evolving needs of potential and existing users. For example, with HAZUS MH, content-specific support might be useful for individual modules and for the software as a whole, supplemented by technical support staff available to address questions specific to modules.
- Develop mechanisms to closely link training with follow-up technical support to ensure that trainees are applying the knowledge they gain and to address ongoing questions as they arise.
- Consider various options for providing technical assistance, ranging from a frequently asked questions fact-sheet to hotline support to case studies or examples combined with how-to instructions.
- Encourage the development of HAZUS Users Groups. Those groups can serve as an informal technical support mechanism through which members can share experiences, answer questions, and discuss various approaches to mitigating risk. Questions that cannot be addressed in the HAZUS User Groups then could be channeled through a central technical support resource provided by FEMA.





## ***Findings Regarding Future Needs and Directions***

FEMA currently undertakes a number of activities to promote HAZUS to the marketplace, including: (1) the distribution of brochures, (2) advertising and communication, (3) training, (4) technical support, (5) promotion through professional associations and conferences, (6) the encouragement and formation of HAZUS User Groups, and (7) the position of HAZUS to support local mitigation planning. Those activities appear to have achieved successful outcomes in some areas and with future enhancements may produce successful outcomes in other areas.

HAZUS appears to be well positioned within the marketplace of established user groups. HAZUS has achieved a distinct competitive advantage in some geographic areas because there are few alternative products that possess the same features as HAZUS while remaining a low-cost tool for end users.

To position the program to better recruit potential users may require more targeted promotions with tailored marketing-mix strategies (such as the application of the Four Ps of Marketing by market segment or target user role). The challenge for FEMA will be to reach untapped market segments through a strategy that demonstrates to each potential user group the benefits and added value of using HAZUS. Ultimately, FEMA must determine the unique discriminators of HAZUS in the marketplace and provide that information (focusing on the specific values and benefits of HAZUS).

Based on input from data collection efforts, HAZUS does not have wide brand name recognition. Therefore, FEMA must continue to concentrate on promoting its product. FEMA may enhance existing marketing efforts, which provide a sound foundation for further efforts, by focusing specifically on the characteristics of various users and understanding the needs of both internal and external users. Targeted marketing mix approaches should help supplement the tools already in place to achieve a higher penetration of HAZUS in key markets segments and geographical areas.

The following discussion presents a summary of future needs and directions, which are organized by market segments. The discussion of users is organized by internal supply-side users (the FEMA market segment) and by external, or demand-side users (the non-FEMA market segments).

### ***Internal Supply-Side Users***

Internal users are considered to include FEMA management and personnel in the FEMA regional offices. Suggestions for how each group could support HAZUS outreach are presented below.

**Senior FEMA Management** – Quantify the return on investment (ROI) and assess benefits using a qualitative, social perspective, framework. This will support FEMA's management in showing the value of HAZUS development costs and the ROI for HAZUS when applied for a variety of mitigation purposes. In addition, FEMA could develop a promotional piece illustrating how HAZUS provides real tools that are available now at a low direct cost to address risks posed by natural hazards as well as priority problems beyond natural hazards (such as those that are technological or man-made).



**FEMA Regions** – Identify unique needs for each region. Each region should identify the top potential 10 HAZUS user groups, by user role, organization, or geography. The needs and missions of those users and the top 10 lists likely will vary by region. That input would be useful to assist FEMA in targeting outreach and training efforts and conducting product analysis on a geographical basis.

**FEMA Headquarters and Regions** – Promote HAZUS as a valuable product and service throughout the entire marketplace. FEMA could conduct a facilitated, high-level strategic planning initiative at Headquarters, which could include input from the FEMA regions. That exercise should focus on two items: (1) identifying the “voice of the customer” (that is, who are the top ten potential users groups and what are their needs); and (2) clarifying the “voice of the business” (that is, what FEMA should be doing on a daily basis to reach its primary and secondary potential users and meet the needs of existing users).

### ***External Demand-Side Users***

External users include: (1) state and local governments, (2) components of U.S. Department of Defense (DoD) and U.S. Army Corps of Engineers (USACE), (3) consultants, (4) academia, (5) private citizens, and (6) international users. The insights below are ranked in order of importance based on study findings.

**State and Local Governments** – This market segment is important because of external driver demands, such as DMA 2000, the mitigation planning regulation, that requires mitigation plans be developed by states to be eligible for mitigation assistance funding. State mitigation plans are required to be in place by 2003.

FEMA Headquarters personnel could work with FEMA regional personnel to actively characterize the data, application, and resource needs required by potential and existing state and local users to apply HAZUS in mitigation plan development. In addition, FEMA should prepare a promotional piece describing how HAZUS can assist in the development of the required mitigation plans. The strategy will help ensure that users are well informed about the benefits of HAZUS with regard to meeting mitigation planning and other obligations.

**Department of Defense (DoD) and U.S. Army Corps of Engineers (USACE)** – This market segment is important because the infrastructure, more resources, and data availability of DoD's components (Army, Navy, and Air Force) are well suited to conducting sophisticated HAZUS analyses. In addition, HAZUS can be used to support counties and regions surrounding DoD installations, thus creating instant HAZUS User Groups. If the benefits of using HAZUS are proven successful at one facility, it can be more easily institutionalized and replicated at installations across the country. The DoD's components and their engineering support organizations (such as USACE military programs) represent a large potential market for HAZUS.

FEMA initially should target the USACE civil works programs for outreach and partnering efforts. Such an approach would be practical as HAZUS MH is tested and proven in the field. USACE, which has a wealth of local data important to the flood module, appears to be most interested in this pending module. In addition, there may be opportunities to use HAZUS in an integrated manner with other existing flood or water modeling software developed by USACE.

**Consultants** – This market segment is important for visibility through professional networks and consultation provided to other potential HAZUS users, such as other non-FEMA federal



agencies and state and local governments. Consultants can provide a critical path through which to promote HAZUS by tapping into their extensive networks, geographic coverage, and clients. FEMA should use a mutual interest or a “win-win” focus in working with consultants. Partnering with consultants should emphasize benefits to the consultants such as: potential to identify local clients to expand their client base, unique work that can be conducted with clients that can then be replicated throughout the company, unique skills that can be obtained and marketed, and the potential for revenue from local users with a clear need and defined funding.

**Academia** – This market segment is important for research, module development, data enhancement, and training development. FEMA should determine which academia institutions have conducted research with HAZUS, created courses based on HAZUS, or have specialized expertise that would complement future HAZUS software modifications. FEMA should determine priority institutions as potential promotion partners.

**Private Citizens** – Private citizens can be an important pool of champions for HAZUS User Group formation. FEMA should track all participants, including private citizens that visit the FEMA or HAZUS booths at conferences to capture this market for potential HAZUS User Group champions. In addition, web site tracking of individuals from various states will allow FEMA to know which geographic areas are interested in HAZUS and allow tracking of changes in interest over time.

**International** – This market segment has a real need and interest in HAZUS and can be a source of revenue for HAZUS, but protecting the infrastructure source data of the United States is an important Homeland Security issue. FEMA should determine options that would allow international use without compromising domestic security. For example, a FEMA software consultant or academia entity could meet the needs of potential international governments for a fee by entering the necessary data and providing the hazard analysis results. Options to remove U.S.-based data layers and add international layers or the option to insert such layers may allow the security issue to be addressed before international distribution.

### ***Recommendations For Next Steps***

The mission of organizations and the motivations of the users will impact the use, or non-use, of HAZUS. FEMA’s resources should be directed to (1) determining the unique needs of essential existing and potential users and (2) aligning HAZUS development and promotion with those needs. If FEMA can highlight the capabilities of HAZUS and set it apart from other technical and management tools available to its users, then users will understand the value of this tool.

A high-level strategy session with FEMA Headquarters staff, including key targeted FEMA regional offices further will help identify measurable short-term and long-term goals for HAZUS development and application. The session would allow the development of a focused marketing strategy. Such a strategy session should be organized around the framework model presented in this marketing study, which includes:

- Analysis of the needs of high probability (high risk) and high population areas
- A focus on important market segments or organizations
- An evaluation of targeted users and user roles needed in various FEMA regions to support HAZUS User Groups



- Identify opportunities and a process for involving the private sector to meet the expected increase in demand for HAZUS training and technical support

The resulting marketing strategy would likely build on information and concepts presented in this preliminary marketing study and correlate with FEMA's goals and objectives for reaching its target users. The strategy will focus on effective ways to distribute information about HAZUS and train users. The strategy should include the following elements: (1) a situational analysis, (2) the refinement of targets for market segments, (3) an evaluation of alternative marketing strategies (marketing mixes), and (4) short- and long-term planning.

**A Situational Analysis** includes information about the key attributes of FEMA by various market segments such as strengths, weaknesses, opportunities, and threats. Information also could be provided about the users, value drivers, decision processes, and concentration areas. Competitors also could be discussed more in-depth such as market position, strengths, and weaknesses. Potential and actual collaborators with similar goals could be presented to provide further distribution channels.

**The Refinement of Targets** includes a summary about what HAZUS users want by market segment, how and why they use the product, and other requirements that FEMA must implement to effectively reach its target distribution and use goals.

**An Evaluation of Alternative Marketing Strategies** includes listing and discussing the marketing alternatives considered before arriving at the recommended or selected strategy. The selected strategy then could be presented. As part of the selected strategy, the optimal marketing mix addressing each of the Four P's (product, promotion, price, and place) could be developed.

**Short- and Long-term Planning** includes the expected short-term and long-term outcomes of the strategy, and the actions and estimated cost required to achieve those outcomes.



# Section 2: Approach and Definition of Concepts

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This section describes the approach applied to conduct the HAZUS MH market study. The Four Ps of Marketing, product, price, place, and promotion, are used throughout this study to present marketing focus areas or segments as they relate to HAZUS MH. Figure 2-1 on the following page defines the Four Ps of Marketing. The framework for evaluating existing and potential HAZUS markets using a segmentation approach is presented below.

## ***Market Segmentation Approach***

Markets for products or services are comprised of customers with varying characteristics that influence why they purchase or use a particular product or service. For example, characteristics of HAZUS users include geography, organizational affiliation, the size of the organization, and the user's occupation. Each customer group (user group), or market segment, will have differing requirements for products or services that can be expressed in terms of the Four Ps of Marketing. Market segmentation groups similar customers by characteristics to understand the relationship between their requirements and the Four Ps of Marketing. This knowledge then can be used to develop appropriate marketing strategies or marketing mixes (varying focuses and approaches to applying the Four Ps of Marketing) for all, or particular, market segments.

Market segmentation in this study is used to evaluate FEMA's current HAZUS market and characterize the users, their perception of the product's quality, and the effectiveness of outreach, training, and technical support. Market segmentation then is used to estimate the number of potential HAZUS users in a viable market and to develop the basis for a marketing approach. Marketing efforts should focus only on viable market segments. Based on established market definitions, a viable market for HAZUS is considered to have three characteristics: (1) an adequate number of current and potential users, (2) an adequate number of users with a need for or an interest in HAZUS, and (3) potential and existing users who are able to obtain and use HAZUS.

The definition of a user of HAZUS has evolved over time. To support this study and other FEMA initiatives, a FEMA workgroup was organized as part of this study to examine the term "user", and develop a framework for the analysis of a HAZUS user. The workgroup determined that HAZUS users could be analyzed on three levels:

- Tier 1: Users defined by the individual's professional discipline and responsibilities (roles)
- Tier 2: Users defined by organizations or market segments (organizations)
- Tier 3: Users defined by geographic location (geography)



## Figure 2-1: THE FOUR PS OF MARKETING: PRODUCT, PRICE, PLACE, AND PROMOTION

**Product:** Product is the organization's tangible offer of goods or services to the market. There are several variables that can affect this aspect of the Four Ps of Marketing, including: quality, design, features, and brand name. These variables represent the types of product or service features that the target market may desire, such as online customer service support. *Product development and diffusion* can be traced through a cycle, commonly called the *product life cycle (PLC)*. The PLC portrays the sales history of a product or service through four stages. Every product or service has a finite or limited life span. That life span is based on the characteristics of the product or service, the marketing goals and objectives of the manufacturer of the product or provider of the service, market competition, and the type of market.

The PLC traditionally has consisted of the following four stages:

- *Introduction or Development* – Characteristics of this stage include slow growth in distribution and sales of the product or service, a lack of awareness of the product or service by the potential user, and limited utilization of the product or service.
- *Growth* – Characteristics of this stage include rapid distribution or sales growth caused by awareness of the product or service by potential users and a significant increase in the utilization of the product or service.
- *Maturity* – Characteristics of this stage include a dramatic slowdown in distribution or sales attributed to an acceptance of the product or service by potential buyers, yielding a saturated market.
- *Decline* – Characteristics of this stage include a decrease in the use of the product or service where there are virtually no sales of the product or service and the product or service is being or has been replaced.

**Price:** Price is the amount of investment that the user must make to derive the intended benefits from the product or service. That is, how much customers pay, or are willing to pay, for the product or service. Usually, price should be commensurate with the product's perceived value to the customer or potential customer. List price, discounts, allowances, payment period, and credit terms all can affect the price of a product. For this study, direct cost is the price paid to obtain HAZUS. Indirect cost is the price paid to implement HAZUS (for example, resources for training, equipment, and personnel).

**Place:** Place is the geographic location of the customer or user relative to the product or service. Infrastructure, inventory, transport, coverage, and channels all are variables that can affect place.

**Promotion:** Promotion is all the activities (tools and outreach methods) an organization undertakes to promote its products and services within the marketplace. This aspect of the Four Ps of Marketing centers on communication, and includes such variables as sales promotion, advertising, sales force, and public relations, all of which can have an important impact upon the success of promotion efforts. *Positioning* is an important aspect of promotion. Positioning is the process of designing a product or service's offering and image so that it obtains a distinct competitive advantage in the mind of the potential user. A competitive advantage can exist where a product or service has one or more of the following characteristics:

- It is important to delivering a highly valuable benefit to a significant number of users
- It has distinctive aspects that are not offered by competing products or services
- It provides superior performance
- It is affordable (that is, users consider the price reasonable)



The following describes each tier of HAZUS users in more detail.

**Tier 1: Users by Role** – The first tier presents data about the individual users of HAZUS who are identified by skill or occupation. Through a general exploration of occupations that may use HAZUS or the information it produces, six distinct roles were identified:

- “Software Operator,” such as a computer programmer, GIS technician, or database manager or administrator
- “Data Enhancer,” such as a line manager or the technical staff in an organization (for example, personnel in building code or public works department)
- “Engineers or Consultants,” who are responsible for designing and enhancing the product used by each of the intermediate or final users
- “Risk Manager” who identifies, quantifies, and supports the mitigation of risk within an organization
- “Leader/Decision Maker,” who has the authority to make the final decision in an organization
- “Earthquake, Wind, or Flood Manager,” who has specific responsibilities for managing those natural disasters

**Tier 2: Users By Organization** – The second tier concerns the types of organizations with which users of HAZUS are affiliated. The primary variable is the type of organization within which an individual user works. Organizations identified for this HAZUS market study include the following government or non-government entities:

Government Entities:

- FEMA
- Federal Agencies not including FEMA (for example, the U.S. Department of Defense)
- State governments
- Local governments
- Other or international government organizations

Non-Government Entities:

- Private sector companies
- Non-profit organizations
- Academia institutions
- Private citizens



A secondary variable identified for this tier is the individual user role defined in Tier 1. This secondary variable is important for the organizational tier, because user roles can vary by organization. For example, the academia segment may involve users in the role of Software Operators, Data Enhancers, and Engineers, but not in the other three user roles. The private citizen organizational group may involve users in the role of Engineers or Consultants, but none in the other five defined roles, as well as the roles associated with each organization type. Also, the roles associated with each organization type depend on the organization itself (that is, on how the organization uses the software or organizes its personnel). Therefore, the organization type defines each role and the specific, necessary characteristics associated with each role. For example, a data enhancer in the federal sector could be very different from a data enhancer working in the academia sector, based on how HAZUS is used by the organization or because of differences in data requirements and applications between the types of organizations.

**Tier 3: Users By Geography** – The third tier of users is based on geography, which defines communities of HAZUS users and user groups. Geographic information for HAZUS is evaluated using the metropolitan characteristics within which the users and user groups are located. This evaluation is based on the accepted method of geographic and population analysis used by the U.S. Bureau of the Census (Census Bureau), which identifies statistically significant geographic locations based on population. The general concept of defining these locations is a core area containing a large population nucleus, together with adjacent communities having a high degree of economic and social integration with that core. This method of evaluation considers the population centers in the United States, and classifies them into one of three categories, based on population levels. The three categories include the MSA, primary metropolitan statistical area (PMSA), and CMSA. These are defined as:

- **Metropolitan Statistical Area (MSA)** An area defined by the Office of Management and Budget (OMB) as a Federal statistical standard. An area qualifies as an MSA if it includes a city of at least 50,000 population or an urbanized area of at least 50,000 with a total metropolitan population of at least 100,000.
- **Primary Metropolitan Statistical Area (PMSA)** An area defined by the OMB as a Federal statistical standard, comprised of one or more counties (county subdivisions in New England), within a metropolitan area, having a population of 1,000,000 or more. When PMSAs are established, the larger area of which they are component parts is designated a CMSA.
- **Consolidated Metropolitan Statistical Area (CMSA)** In metropolitan areas where PMSAs are defined, the larger area of which the PMSAs are components is designated a CMSA.

The market study approach described above now will be applied to defining the current market (Section 3 of the report) and the future market (Section 4 of the report).





## Section 3: The Current Market

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This section explores the current HAZUS market using the approach defined in Section 2 of the report. First, the section reviews the findings of a 1999 study performed by NIBS. It then presents an analysis of information contained in the FEMA HAZUS distribution and tracking database (FEMA HAZUS Users Database) generated as a part of this study. The FEMA HAZUS Users Database houses information about individuals that have received a copy of the HAZUS software, expressed an interest in HAZUS, attended a HAZUS training course, or received technical support on the use of HAZUS. Lastly, training and technical support findings for the current market are presented.

### ***NIBS Study Findings***

This section uses the framework of the Four Ps of Marketing and market segmentation approach introduced in Section 2 to present the findings of a study conducted by NIBS in 1999. Insights drawn from the NIBS study are provided in Table 3-1.

Of the 88 respondents included in the study, 52 (59%) were implementing HAZUS and 36 (41%) were not HAZUS users. Of the 52 users, 48 represented the U.S., while 2 users represented U.S. territories and 2 users represented international organizations. A summary of the 48 users in the United States is provided in Table 3-2.

Additional insights provided by the NIBS study are provided as part of training and technical support findings later in this section and in the conclusions and recommendations of this report.

### ***Analysis of the Current Market – The FEMA HAZUS Users Database***

Another source of information regarding individuals familiar with and potentially using HAZUS is the FEMA HAZUS Users Database. Tetra Tech developed this database in Microsoft Access® database for FEMA to track distribution and training data related to HAZUS earthquake module. As the market study was progressing, Tetra Tech obtained updated information about training and outreach from a variety of sources, including the latest data related to distribution, training, and technical support. That data was combined with the NIBS Master Distribution List to create a user database for further analysis, as defined by FEMA. The FEMA HAZUS Users Database contains records for 1,759 individuals including their roles and organization information. However, information regarding the frequency of individual HAZUS use is undetermined for the purposes of this study.

The FEMA HAZUS Users Database was used to profile the 1,759 individuals. Specific user information includes user name, title, organization, address, telephone number, fax number, and e-mail address. Based on individual job titles, the database classifies as many of the HAZUS users as possible into one of the six HAZUS users roles described in Section 2 of this report. Market segment information housed in the database includes the names and types of organizations.



**Table 3-1  
INSIGHTS REGARDING HAZUS FROM NIBS STUDY  
ORGANIZED BY THE FOUR Ps OF MARKETING**

Four P Criteria	Insights Provided by Study
<b>Product (What)</b>	<b>Technical Strengths:</b> <ul style="list-style-type: none"> <li>Some respondents indicate HAZUS is user friendly</li> <li>More than half of the respondents who use HAZUS do so without the benefit of training</li> <li>Some respondents indicate HAZUS is being used for mitigation; despite the absence of tools for using HAZUS for mitigation, users in 12 states are involved in mitigation planning</li> </ul>
	<b>Technical Opportunities for Improvement:</b> <ul style="list-style-type: none"> <li>Some respondents report waiting for additional features (for example, the flood and wind modules)</li> <li>Some respondents indicate that HAZUS takes too much time to use</li> <li>Some respondents indicate that they see HAZUS as a data source only, rather than as a tool for data analysis and planning</li> <li>Some respondents indicate that the product is complicated to learn and that additional training and GIS experience is required to use the product</li> <li>Some respondents cite a data collection requirement as a barrier to using HAZUS</li> </ul>
	<b>Management Strengths:</b> <ul style="list-style-type: none"> <li>Some respondents indicate HAZUS is considered reliable or useful enough for generating reports for other agencies</li> </ul>
	<b>Management Opportunities for Improvement:</b> <ul style="list-style-type: none"> <li>Some respondents note that a lack of executive support is an institutional barrier to HAZUS use</li> <li>Three respondents indicate that institutional reasons, including acquiring data from other agencies, is a barrier to use</li> </ul>
<b>Price (How much)</b>	<b>Development Costs:</b> <ul style="list-style-type: none"> <li>None noted</li> </ul> <b>Direct Costs:</b> <ul style="list-style-type: none"> <li>None noted</li> </ul> <b>Indirect Costs:</b> <ul style="list-style-type: none"> <li>Resource-related barriers resulting in non-use of HAZUS include:</li> <li>A lack of funding for implementation (including lack of funding for new computer hardware, GIS software platforms, and time for training)</li> <li>Inadequate computer equipment and software</li> </ul>
<b>Place (Where)</b>	<b>Place-related Information:</b> <ul style="list-style-type: none"> <li>48 of the 52 users are from the U.S. (92%)</li> <li>Respondents are located in 24 of the 38 earthquake prone states (63%)</li> <li>More than half of the respondents are from 7 states: California, Oregon, New Jersey, Illinois, Colorado, Georgia, and Maryland</li> </ul>
<b>Promotion (How)</b>	<b>Promotion-related insight:</b> <ul style="list-style-type: none"> <li>Some users noted that executive level managers were not sufficiently supporting the use of HAZUS. This may indicate that greater promotion to executive-level personnel could assist in diffusion of the HAZUS software.</li> </ul>

Source: NIBS HAZUS Evaluation Results Study





**Table 3-2  
NUMBER OF RESPONDENTS TO NIBS STUDY IMPLEMENTING HAZUS**

Market Segment Information	Number of Respondents	Percentage of Respondents
<b>Government</b>	<b>28</b>	
Federal	7	25% of government respondents
National Laboratory	1	3.5% of government respondents
Regional Agency	1	3.5% of government respondents
State Agency	15	53.6% of government respondents
Local Agency	4	14.4% of government respondents
<b>Private</b>	<b>20</b>	
Private firms	10	50% of private respondents
Universities	9	45% of private respondents
Independent (geologist)	1	5% of private respondents
<b>TOTAL</b>	<b>48</b>	<b>100%</b>

Source: NIBS HAZUS Evaluation Results Study

Geographic information in the database includes standard address information, including city, state, and zip code; the FEMA region, determined by the state in which each HAZUS user is located (or the area code of the user's telephone number); the county, based on the city and standard GIS data; and where applicable, the Census Bureau MSA designation. The database also indicates whether HAZUS users have attended a training course and the date of training received.

### ***The Market Segmentation Model***

The application of the market segmentation model to the data, as well as associated analyses, reveals a number of characteristics that assist in understanding the current market. The characteristics are described by the three tiers of the market segmentation model, pertaining to user roles, organization type, and geographic location. Each of these tiers and the associated characteristics of the HAZUS users is presented in Figure 3-1. As the figure illustrates, the data can be analyzed for all three user tiers described in Section 2 (user role, user organization, or geographic location). Tier 1 shows the percentages of the assigned user roles within the database. Not every HAZUS user in the database is assigned a role, as not every individual had supplied a job title to FEMA. However, the users that can be assigned a role are included in the figure. Figure 3-1 also shows that more than 25% of the users working in the private sector/non-profit/quasi-government market segment, with more than 20% working in the local government market segment. Tier 3 shows the percentages of penetration at each MSA level (penetration means that at least one individual is listed within the database for a defined area). For example, at least one individual is listed for all 19 CMSAs.



**Figure 3-1: FEMA HAZUS USERS DATABASE PROFILES**

Tier 3: Users by Geography and Community		MSA [53.5% penetration]		Primary MSA [56.6% penetration]		Consolidated MSA [100% penetration]			
Tier 2: Users by Organization		Governmental Market Segments				Non-Governmental Market Segments			
Tier 1: Users by Roles*		Federal (FEMA) [6.5%]	Federal (Non-FEMA) [6.2%]	State Government [13.8%]	Local Government [20.4%]	Inter-national Govt [3.6%]	Private Sector/ Non-Profit [26.5%]	Academe [18.1%]	Private Citizen [4.1%]
Software Operator	[10.3%]	[28.0%]	[15.3%]	[15.3%]	[22.3%]	[23.5%]	[15.7%]	[6.3%]	[75%]
Data Enhancer	[39.8%]	[16.0%]	[45.0%]	[37.5%]	[23.5%]	[23.5%]	[23.6%]	[92.4%]	[25%]
Engineer or Consultant	[12.1%]	[20.0%]	[3.6%]	[1.9%]	[0.0%]	[0.0%]	[14.3%]	[1.3%]	
Risk Manager	[25.8%]	[16.0%]	[19.8%]	[21.7%]	[29.5%]	[5.0%]	[5.0%]		
Leader/ Decision Maker	[6.8%]	[20.0%]	[15.3%]	[9.3%]	[23.5%]	[41.4%]			
Flood Plain Manager or Building Code Official	[5.2%]		[1.0%]	[7.3%]	[0.0%]				

Percentages of assigned roles within the FEMA HAZUS

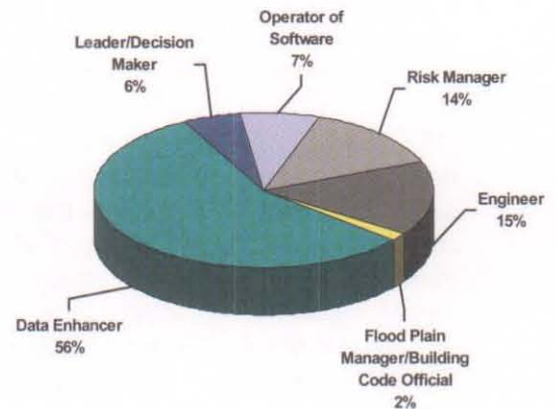




## Tier 1: HAZUS Users by Roles

Figure 3-2 depicts, by roles, the percentage of users for whom a role was assigned within the HAZUS user database. This is one indicator of the types of users with whom FEMA is making contact through promotional efforts. More than half of the users with assigned roles are classified as data enhancers, due to reliance on HAZUS data outputs by mid-level or line managers. The dominance of data enhancers also results from a large number of academia users who use the software model for research, applying it to either create new or verify old data. There also are a higher percentage of leaders/decision makers than originally expected. This may be due to a large percentage of users in the private sector/non-profit/quasi-government segment, where leaders and decision makers in an organization may order the software (and therefore be listed in the database), and then pass the tool to mid-level managers and operators of the software to use.

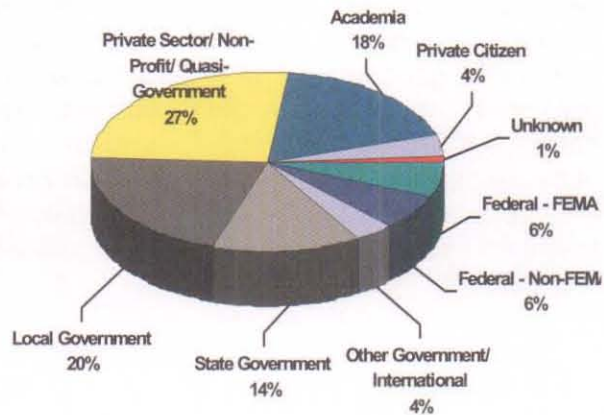
Figure 3-2: HAZUS USER ROLES



## Tier 2: HAZUS Users by Organization

Figure 3-3 shows the percentages of individuals in the database by type of organization. This is important because it is an indicator of the types of organizations for which HAZUS users work and, presumably, the types of organizations currently using HAZUS. The current database includes a concentration of individuals in the private sector/non-profit/quasi-government and local government market segments -- about 27% of users are in the private sector/non-profit/quasi-government segment, while 20% are found in the local government segment, accounting for roughly 47% of all HAZUS users. The state government, academia, and combined federal government market segments include comparable numbers, at 18%, 14%, and 13%, respectively. The segments representing private citizens and the other government/international organizations represent only about 4% each. These results indicate that there is potentially a high level of interest within the private sector/non-profit/quasi-government segment as well as the local government segment, to which many of the regional FEMA offices distribute the HAZUS software.

Figure 3-3: HAZUS USER ORGANIZATIONS



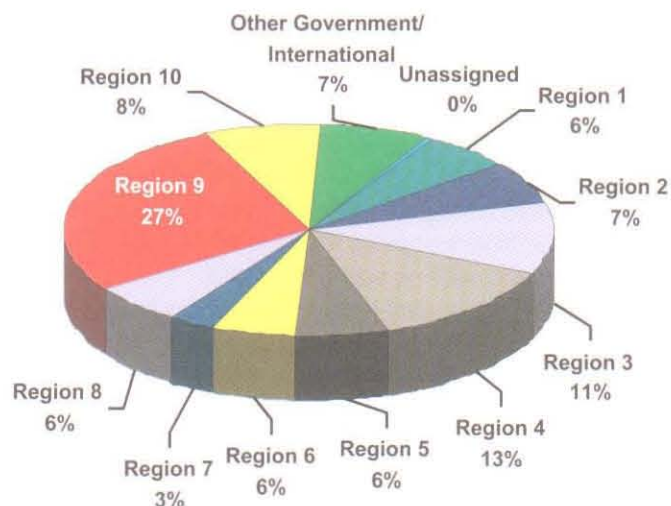
Within the organizations, the roles show results that are consistent with the Tier 1 analysis presented in Figure 3-2. Data Enhancers account for the highest percentage of users within five of the eight organization types shown in Figure 3-3. Software operators and leaders/decision makers both generally are second in percentage behind the data enhancer role.



### Tier 3: HAZUS Users by Geography and Community

Figure 3-4 presents a breakout of individuals within each FEMA region. Table 3-3 lists the states within each region. The FEMA region breakout provides insights regarding the “place” factor of the Four Ps of Marketing. As HAZUS currently includes the earthquake module only, one would expect more users in regions that are classified as “earthquake prone” (for example, FEMA Region 9, which includes California). Indeed, the distribution of HAZUS users across the FEMA regions shows expected results, with more than a quarter of the documented users residing in FEMA Region 9, followed by Region 4 with 13% of the users and Region 3 with 11%, of the users. Region 4 comprised of states within the southeastern U.S., due to historic earthquake activities such as the 1811-1812 New Madrid series earthquakes, the 1843 Memphis, Tennessee earthquake, and the 1886 Charleston, South Carolina earthquake. The large number of users in Region 3 probably is because FEMA headquarters, from which HAZUS is distributed, is located in that region.

Figure 3-4: HAZUS USERS BY FEMA REGION



Using the information contained in the FEMA HAZUS Users Database and information derived from various other sources, Tetra Tech constructed several GIS views to analyze, interpret, and present the geographic data associated with the current database. Figure 3-5 illustrates graphically the geographic distribution of users, based on user zip codes. Each of the 1,759 entries is reflected in Figure 3-5; however, some overlap occurs between identical zip codes because only one point is shown for each zip code. As the figure shows, the users of HAZUS are concentrated along the western and eastern coasts of the United States, with users scattered throughout the southeast, along the Mississippi River, and throughout the Midwest and states in the Rocky Mountains.





**Table 3-3  
FEMA REGIONS DEFINED**

FEMA Region	States and Other Entities Comprising the Region
Region 1	Connecticut, Maine, Massachusetts, New Hampshire Rhode Island, Vermont
Region 2	New Jersey, New York, Commonwealth of Puerto Rico, Territory of Virgin Islands
Region 3	Delaware, Maryland, Pennsylvania, Virginia, West Virginia
Region 4	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee
Region 5	Illinois, Indiana, Michigan, Minnesota, Ohio Wisconsin
Region 6	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
Region 7	Iowa, Kansas, Missouri, Nebraska
Region 8	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
Region 9	Arizona, California, Hawaii, Nevada; the Territories of American Samoa and Guam; the Commonwealth of the Northern Mariana Islands; the Republics of the Marshall Islands and Palau; the Federated States of Micronesia
Region 10	Alaska, Idaho, Oregon, Washington

Source: FEMA HAZUS Users Database

Table 3-4 presents for each FEMA region, the top two market segments (organization type) by organization (Tier 2) geography (Tier 3).

**Table 3-4  
TOP TWO MARKET SEGMENTS BY FEMA REGION**

Market Segment	FEMA Region									
	1	2	3	4	5	6	7	8	9	10
<b>Government</b>										
Federal FEMA			20.1%							
Federal Non-FEMA										
State Government	24.8%					18.4%	28.8%	21.6%		
Local government				28.5%	23.6%		23.1%	29.7%	25%	37.7%
International										
<b>Private</b>										
Private, non-profit, quasi-government	36.6%	25.6%	33%		27.4%	18.4%			36.3%	16.7%
Academia		29.9%		20.2%		25.5%				
Private citizen										

Source: FEMA HAZUS Users Database



Figure 3-5: GEOGRAPHIC DISTRIBUTION OF INDIVIDUALS IN HAZUS USERS DATABASE

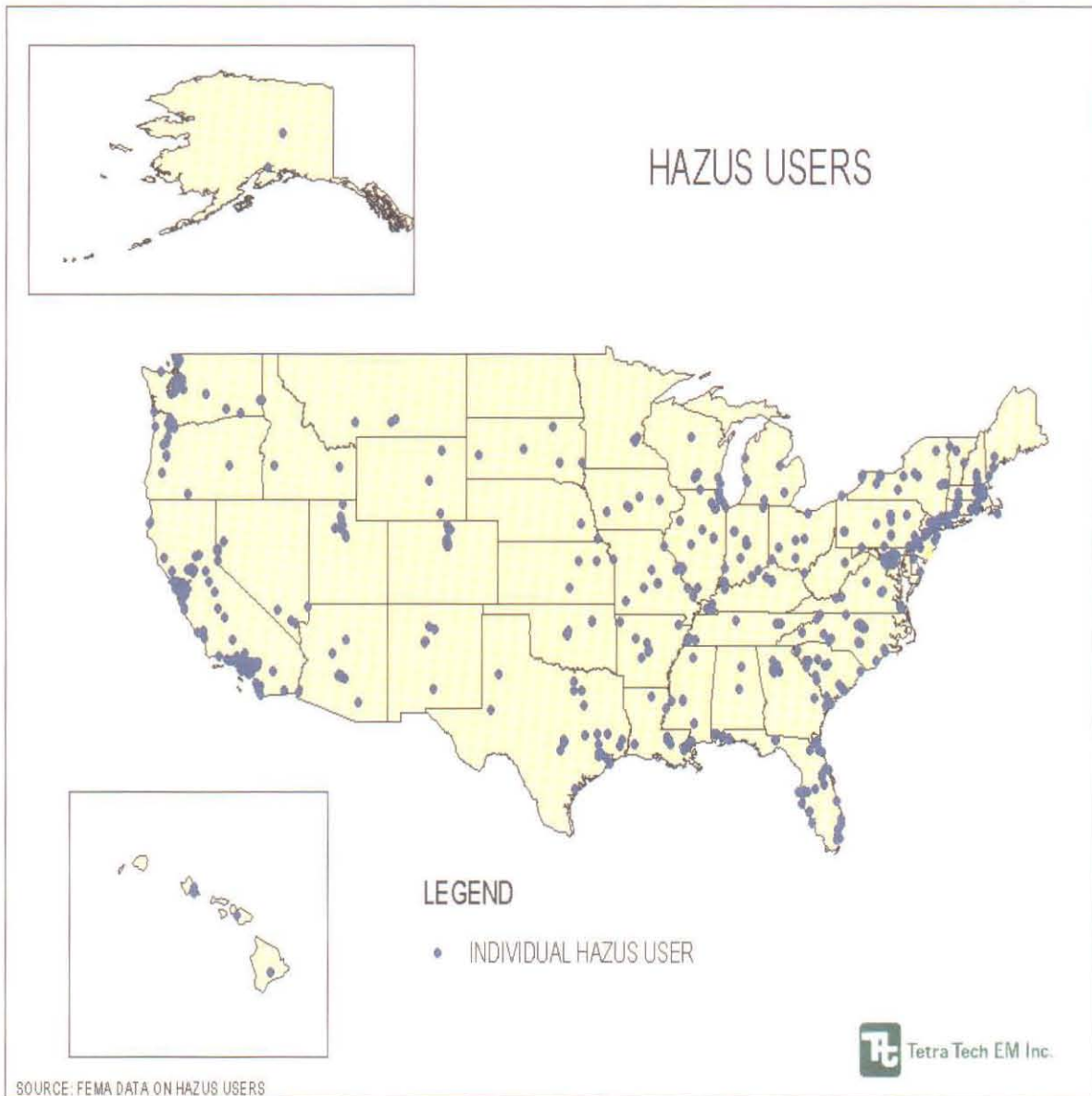




Figure 3-6 presents the geographic distribution of users, based on the definitions of the Census Bureau population centers. As the figure shows, more than 45% of the individuals are located in the major population centers or CMSAs of the U.S. Over 30% of the existing users are located in a MSA, while about 20% are located in non-metropolitan areas. This suggests that users in high population centers may be concerned more with estimating damage due to earthquakes than their counterparts in low-density population areas. Because most PMSAs, by definition, are part of a CMSA, individuals in those PMSAs are counted with the CSMA category. That approach accounts for the low percentage of users reported for PMSAs.

**Figure 3-6: HAZUS USERS  
BY TYPE OF MSA**

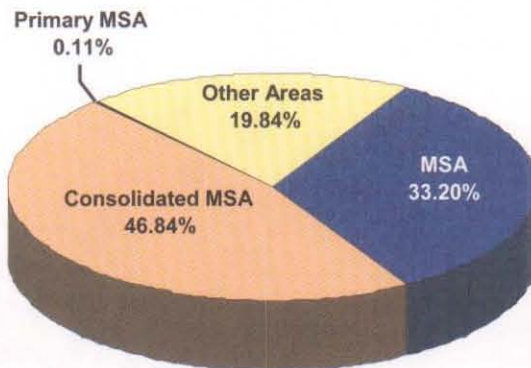
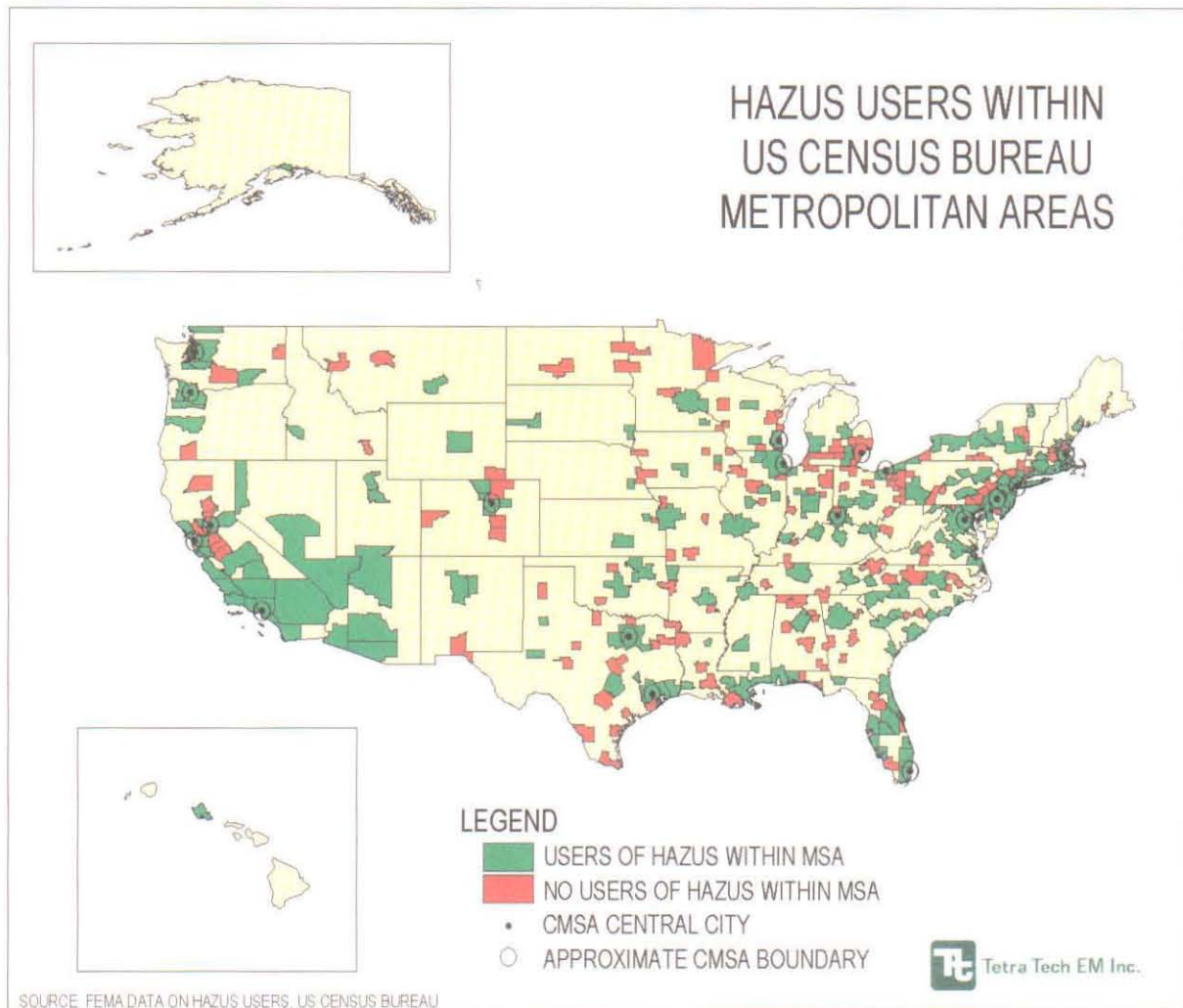


Figure 3-7 presents an analysis of the individuals in the HAZUS User Database within the MSAs and CMSAs. The green areas are MSAs in which HAZUS users are located while the red areas are MSAs in which there are no current users of HAZUS. At least one user is listed within all 19 CMSAs, for which the central city is depicted as a point in Figure 3-7. Suburban areas around the CMSAs are denoted by circles surrounding the central city point.

Figure 3-7: HAZUS USERS WITHIN U.S. CENSUS BUREAU METROPOLITAN AREAS



**Figure 3-8: HAZUS MSA PENETRATION**

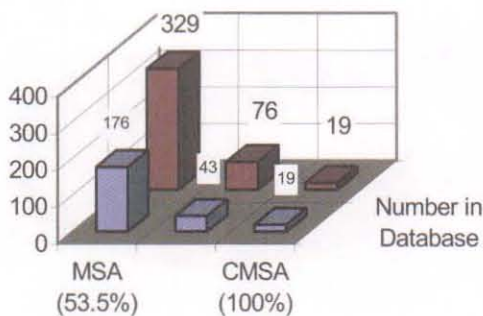
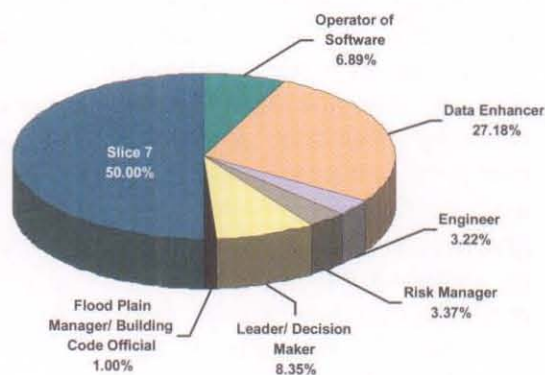


Figure 3-8 shows the penetration numbers and percentages of individuals in the HAZUS Database by MSA type. As the figure illustrates, the penetration rate of HAZUS into population centers is high. Individuals are listed in 176 of the 329 MSAs, which equal a 53.5% penetration rate. Similarly, there is a 56.6% penetration rate for the PMSAs and a 100% penetration rate for the CMSAs.

Figure 3-9 shows the distribution of roles within the metropolitan areas. This analysis was derived by measuring the percentage of each assigned role after combining the number of all MSAs, PMSAs, and CMSAs. More than 50% of the individuals in the HAZUS Users Database in metropolitan areas are data enhancers, while the second and third largest percentages are the leader/decision maker and operator of software roles.

**Figure 3-9: ROLES WITHIN MSAs**



**Figure 3-10: ROLES IN NON-MSAs**

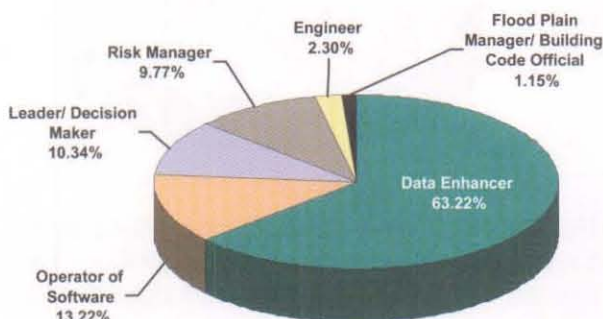


Figure 3-10 shows the distribution of assigned roles within the non-metropolitan areas of the United States. This analysis was performed by examining all the roles of individuals in the HAZUS Users Database outside of the metropolitan areas. As the figure illustrates, more than 60% of the existing users in non-metropolitan areas are data enhancers, followed by software operators and leader/decision makers.

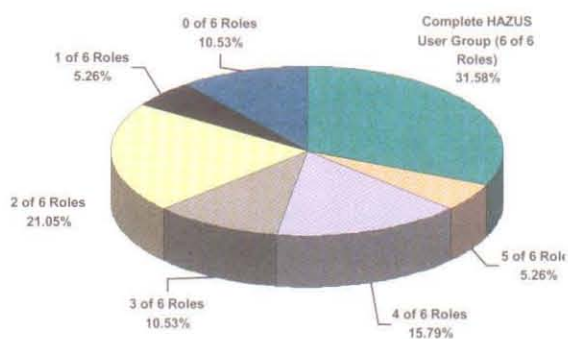
HAZUS User Groups are discussed in Section 4 of this report. A HAZUS User Group is a cooperative partnering of representatives of public sector, private sector, and academia organization representatives. A HAZUS User group generally includes volunteers from among private citizens, representatives of state and local governments, and private industry. Although the HAZUS rate of penetration into high population areas is high, a modest number of those areas have all the user roles necessary to form a HAZUS user group.





Figure 3-11 presents the percentage of CMSAs by the number of roles associated with each. This is important to note because if all the roles are present within a CMSA, that CMSA is a prime candidate in which to form a HAZUS user group. As the figure illustrates, slightly more than 30% of the CMSAs contain at least one user from each role.

**Figure 3-11: NUMBER OF ROLES IN CMSAs**

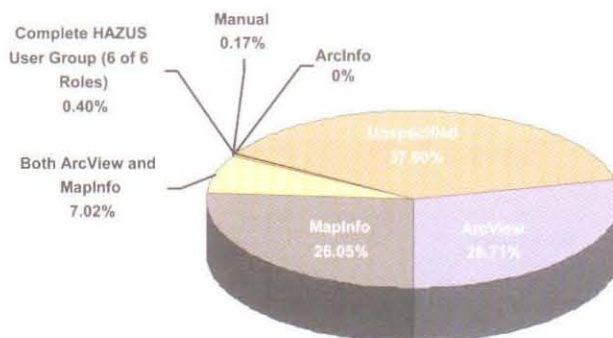


### Additional Database Analysis

Information in the FEMA HAZUS User Database also was analyzed to find product-related information. Figure 3-12 shows the percentages of GIS platforms employed by the existing HAZUS users to run the software. This could be an indicator of the type of HAZUS software that has been distributed to date. Unfortunately, more than 35% of the individuals had not provided information pertaining to the type of GIS platform used by them or their organization.

However, of the individuals that had reported about the type of GIS platform, there is roughly an even split between the MapInfo<sup>®</sup> and ArcView<sup>®</sup> GIS products, with an additional 7% of the individuals reporting that their organization uses both GIS products. In total, more than 35% of the users report that they have access to one of the ESRI products (ArcView<sup>®</sup> or ArcInfo<sup>®</sup>). Last, despite the fact that HAZUS is a computer software program, 0.2 percent of individuals report using HAZUS outputs with manual, paper-based geographic analyses.

**Figure 3-12: HAZUS USERS GIS APPLICATIONS**



Figures 3-13, 3-14, and 3-15 show additional GIS distribution of individuals in the HAZUS User Database within the MSAs and CMSAs, previously presented in Figure 3-7, and now overlain with natural hazard risks. The green areas are MSAs in which individuals are located while the red areas are MSAs in which there are no current users of HAZUS. These figures depict the higher population areas in relation to areas of high risk from natural hazards. Figure 3-13 overlays earthquake data and Figure 3-14 overlays hurricane trends. Figure 3-15 is an example of an analysis of an individual floodplain level; in this case, floodplain areas in the New York-Northern New Jersey-Long Island CMSA have been overlaid with data from the HAZUS Users Database. Figure 3-15 shows that a 100-year floodplain lies in New York-Northern New Jersey-Long Island area; individuals are listed in the HAZUS Users Database for New York-Northern New Jersey-Long Island CSMA that overlay with that floodplain.

Figure 3-13: HAZUS USERS DATABASE DATA OVERLAY WITH EARTHQUAKE TRENDS

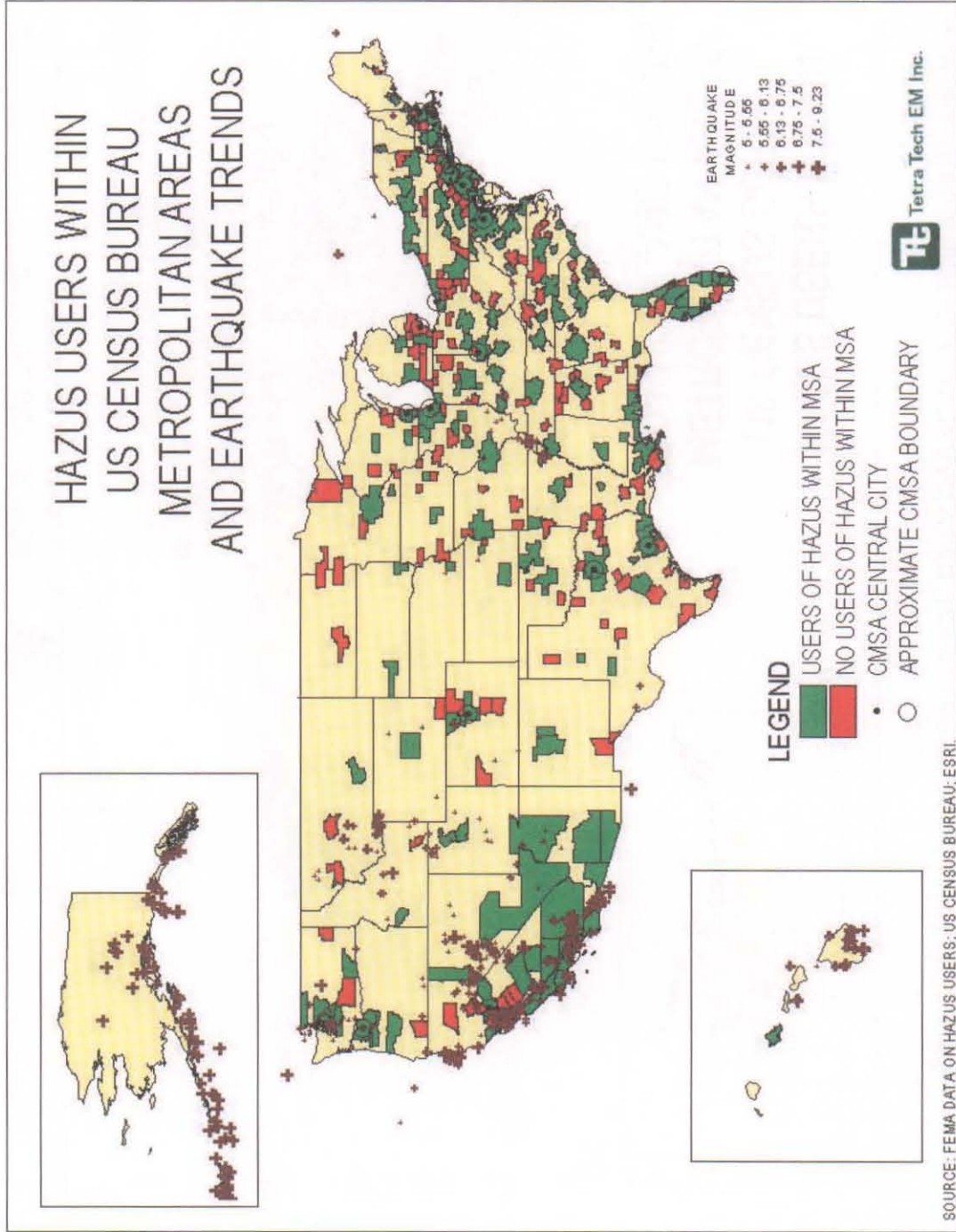




Figure 3-14: HAZUS USERS DATABASE DATA OVERLAY WITH HURRICANE TRENDS

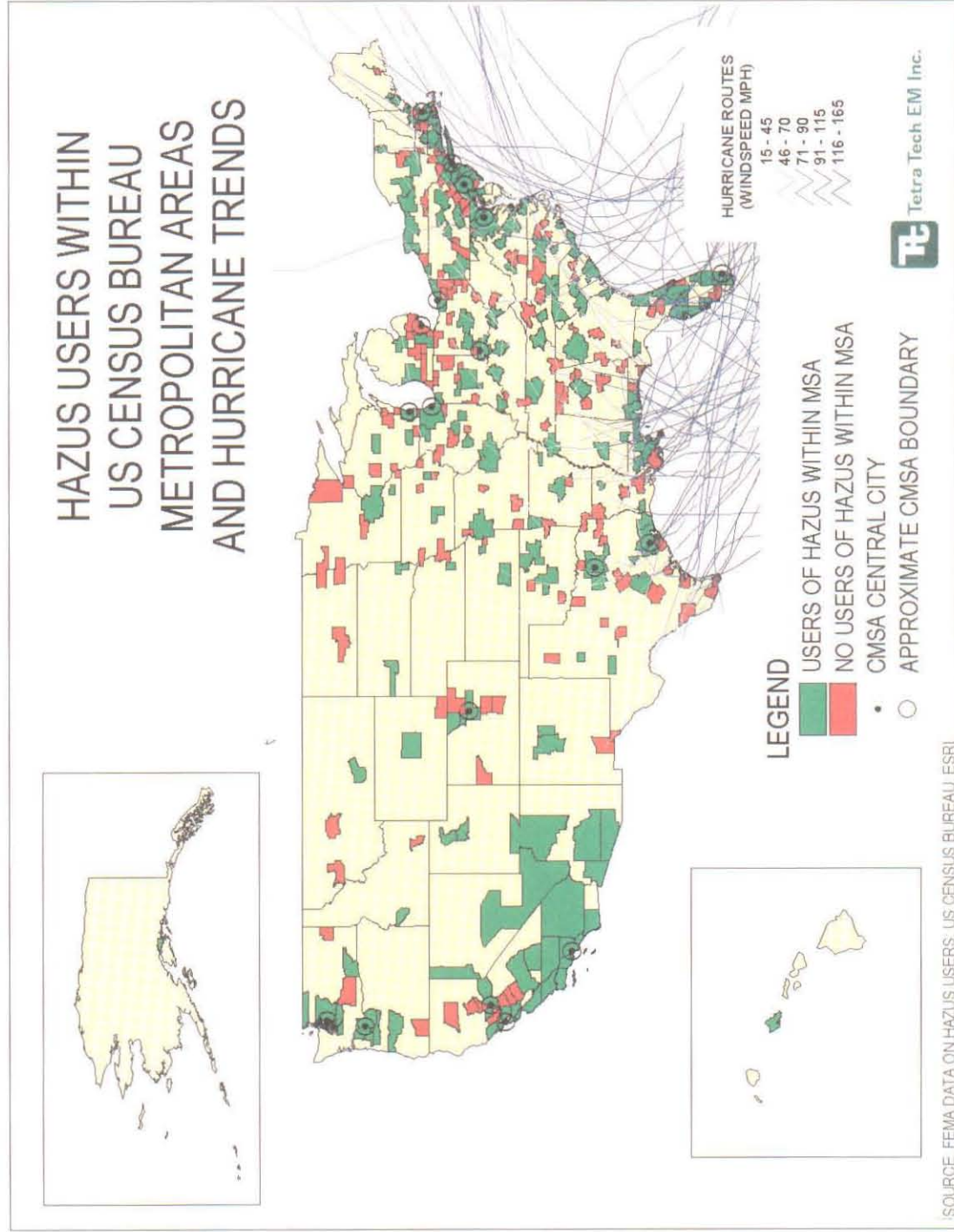


Figure 3-15: EXAMPLE FLOODPLAIN ANALYSIS

HAZUS Users Within U.S. Census Bureau Metropolitan Areas and Localized Floodplain Trends within the New York-Northern New Jersey-Long Island (NY-NJ-CT-PA) Consolidated Metropolitan Statistical Area



SOURCE: FEMA DATA ON HAZUS USERS; US CENSUS BUREAU; ESRI





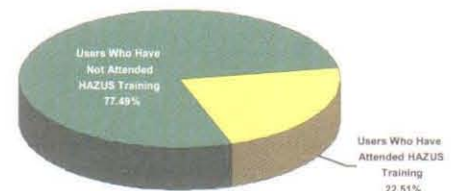
## Training and Technical Support Findings

Information about HAZUS training and technical support from the FEMA Emergency Management Training Institute (NETI) also known as the EMI, the NIBS Master Distribution List, and the FEMA HAZUS Users Database indicate that:

- 396 individuals had participated in HAZUS training conducted between 1997 and 2001
- Approximately 20 individuals had participated in each HAZUS training conducted between 1997 and 2001
- 155 of the 1,759 individuals in FEMA's HAZUS Users Database also are listed on the EMI reports of training conducted between 1997 and 2001

Figure 3-16 presents the percentage of individuals in the HAZUS Users Database who have received training on HAZUS. As the figure shows, only 22.5% have received some kind of training on HAZUS. This includes data on training sessions conducted between March 10, 1997 and November 9, 2001. However, a significant number of individuals have been trained by the Bay Area HAZUS User Group (BAHUG) in FEMA Region 9. BAHUG is an active earthquake hazard information outlet and preparedness presence in the region. Participants in BAHUG are taking the opportunity to learn about earthquake-related concerns and understand the risk potential and ways to lessen potential damage.

**Figure 3-16: TRAINED HAZUS USERS**



**Figure 3-17: TRAINED HAZUS USERS BY REGION**

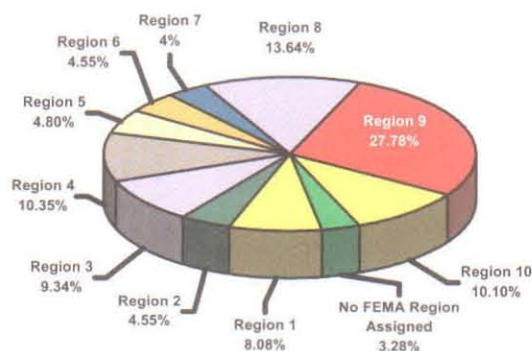


Figure 3-17 presents the percentage of trained individuals by FEMA region. As the figure shows, approximately 28% of individuals who had received training on HAZUS are from Region 9. Again, this is probably due to the larger number of earthquakes in Region 9, and thus, a higher need in that region for HAZUS.



**Figure 3-18: TRAINED HAZUS USERS BY ORGANIZATION**

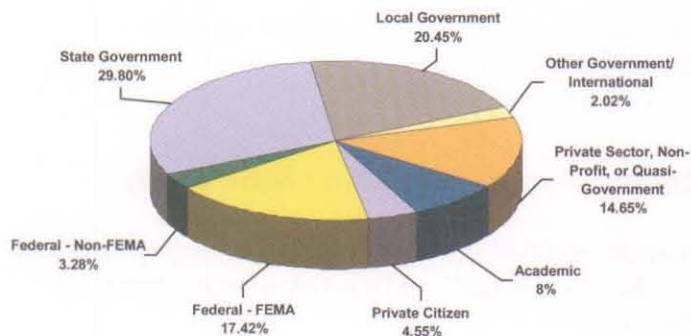


Figure 3-18 presents the percentage of trained individuals by type of organization. As the figure illustrates, approximately 30% of individuals who had participated in HAZUS training are from the state government market segment, which does not correlate to the percentage of HAZUS users by organization type presented in Figure 3-1. The local government segment accounts for just over 20% of individuals who have received training on HAZUS, and this, too, does not

correlate to the percentage of total individuals in the database by organization type. This is an important finding, as it may indicate patterns of use. Those individuals who actively sought training are more likely to be using the product. Therefore, the state and local government market segments may be more actively using the product than other market segments, although the rates of distribution of HAZUS among the other segments may be higher. Another contributing factor may be that HAZUS training is provided free-of-charge to the state and local government personnel, which could account for the higher training rate.

In addition to the training information that was analyzed from the NIBS Master Distribution List, the FEMA HAZUS Users Database and EMI, a training and technical support workshop was conducted as a part of this study in October 2001 to obtain input about current HAZUS training and technical support efforts. Tetra Tech assembled representatives from FEMA Headquarters and its Regions, NIBS, and FEMA contractors at this workshop. The group discussed the status of HAZUS training and technical support. Participants indicated the following:

- Current basic and advanced training courses for HAZUS focuses on the software operators, data enhancers, floodplain managers and engineers and consultants
- The mitigation planning course for HAZUS addresses the needs of floodplain managers, decision makers, and risk managers
- Potential training gaps exist in the areas of data collection for data enhancers and a HAZUS overview for decision makers
- HAZUS training and HAZUS software are made available but its use is not mandated; however, the need for state and local entities to comply with the DMA of 2000 may provide a driver for HAZUS use and likely will increase the need for training and technical assistance. (DMA 2000 is discussed in Section 4 of this report.)

## ***Overall Training and Technical Support Findings***

Major findings about training and technical support from the NIBS study and information collected from current existing and potential users are as follows.

### ***Findings Regarding Training and Technical Support Based on NIBS Study***

- Provide more frequent training and, preferably, local training in high density, high risk areas; areas of high probability for the events modeled in HAZUS and with high populations are likely to be strong demand centers for HAZUS
- Offer different types of training for different types of HAZUS users (that is, tailor training by market segment or user role)
- Distribute HAZUS software online or through a network; the current distribution channel is expensive and does not allow quick and easy access to HAZUS
- Consider a four-day training that provides hands-on learning, uses more trainers, and is offered at a slower pace
- Consider providing online, free training an option; considered a high priority for private sector users, primarily consultants, who normally would not be able to take a few days off for training
- Incorporate in training hazards specific to fire department or other examples of multi-hazard analysis
- Provide case studies targeted to local communities and provide how-to guides for data collection, because local data collection appears to be a prevalent issue for state and local respondents
- Maintain an accurate list of all persons trained in HAZUS through EMI, HAZUS User Groups, and other organizations, and make the list available on the web to regions and other interested parties
- Compile a mailing list or e-mail distribution list of emergency managers and planners (or other FEMA target groups) and use this list to help remind potential and existing users of the benefits, pilot project opportunities, and upcoming training for HAZUS
- Ensure that HAZUS is compatible with databases and software platforms used by potential and existing users
- Because of the benefits of HAZUS, continue to integrate HAZUS into more of the functions of FEMA



## ***Findings Regarding Training and Technical Support Based on Market Study***

Findings based on data collected from existing and potential users in various market segments including: existing federal users, potential federal users, existing and potential state and local government users, and existing and potential private users.

### ***Input from Existing Federal Users***

Insights about Training Needs: Half the existing federal user respondents said they would like case studies as methods of training; one person suggested that such training be 1 to 2 days in duration. More than 40 percent of respondents said they would like courses about how to use GIS as well as GIS tutorials. More than one-third said they would like courses about how to interpret data and a “HAZUS 101”. Interestingly, the choice that ranked the lowest was “sales” information about the benefits of the system. This finding illustrates an apparent disconnect between needs identified in the October 2001 workshop held between FEMA, NIBS, and contractors. These respondents appear more interested in learning how to use the software rather than focusing on publicizing its benefits.

More than 63 percent of respondents said they would like to receive onsite training. Other preferences were online tutorials (over 54 percent), internet training (45 percent), and an offsite, two-day training class (over 40 percent). Most people did not appear interested in taking training at a community college or receiving a compendium of prepared training classes that could be combined as needed.

- More than half (55%) of respondents would like to take basic courses on earthquake, flood, and wind hazards
- Approximately one-fourth (27.5%) of respondents would like to take a basic HAZUS course, while another quarter (24%) of respondents would like to take an advanced HAZUS course
- 31% of respondents would like to take a basic GIS course
- 34% of respondents would like to take a course about how to interpret data
- 72% of respondents would like to use case studies and tutorials in HAZUS training
- Three-quarters (75%) of respondents would like to take training over the internet or would like to work with on-line tutorials
- Slightly more than half (51%) of respondents would like to have onsite training
- 34% of respondents would like to take an offsite, two-day training course

Insights about Technical Support Needs: Respondents resoundingly preferred receiving technical support either online or through a telephone hotline, with a slight preference for online support. More than 90% of respondents indicated that both telephone and on-line technical support would be helpful.



One person noted that the turnaround time for technical support must be short, and another mentioned that they like to talk through problems as they arise. Other respondents suggested ongoing, onsite support or a users conference conducted via satellite, as a method of receiving technical support. When asked about the topics that would require technical support, users responded that data entry, data interpretation, and software operations are the primary topics about which they need technical support.

### ***Potential Federal Users Needs:***

Insights about Training needs: The types of training identified as most useful to potential federal users are, in order of preference: "Flood 101" (more than 68 percent), courses about how to interpret data (63 percent), "HAZUS 101" (more than 57 percent), tutorials (nearly 53 percent), and case studies (47 percent). Regarding the forms of training, more than 57 percent of respondents in this market segment would like to receive onsite training, followed by preferences for online tutorials (nearly 53 percent) and Internet training (47 percent).

- Half the respondents indicated that they would be interested in basic HAZUS and data interpretation courses
- More than half (55%) of the respondents indicate that they would like to attend a basic course about flood hazards
- Earthquake and wind hazards were not as high, at 12.5% and 33%, respectively
- Half the respondents were relatively equally interested in online tutorials, Internet training, and onsite training

Insights about Technical Support Needs: These potential users expressed a preference to receive online technical support and telephone support in that order. Respondents also stated that they would like to receive technical support about how to operate the software and how to interpret the data, as well as how to integrate the software with other tools and data.

- More than 90% of respondents indicate that both telephone and on-line technical support would be helpful
- Software operation and data interpretation are the primary topics on which respondents need technical support

### ***State and Local Government: Training and Technical Support***

Insights about Training Needs: The respondents stated that the most helpful training would be tutorials, courses about how to interpret data, "Flood 101" and "Advanced HAZUS". They said they would prefer to receive offsite two-day training; online tutorials; Internet training; and onsite training.

- All the respondents stated they would like to attend training about how to interpret data, basic flood hazards, and advanced HAZUS use
- All the respondents stated they would like to use tutorials in training sessions



- All the respondents stated they would like to participate in offsite, two-day training; online tutorials and Internet training; and onsite training

Insights about Technical Support: These potential users expressed a preference to receive technical support through online or telephone hotlines, particularly as it relates to operating the software, and making modifications to default data, and using units other than census tracts. One of the two respondents in this market segment said they would be interested in supporting a HAZUS User Group; the other said “maybe”.

Both respondents said they would like to receive additional information about HAZUS. One stated that FEMA should do whatever is necessary to make it user-friendly; these are emergency managers, not folks that sit around playing with computers all day.





# Section 4: The Future Market

This section of the market study report evaluates the future market for HAZUS. Information used in the evaluation was obtained from research regarding potential and existing HAZUS users. The information obtained is used to present quantitative and qualitative findings. The future market is first analyzed using data of the U.S. Bureau of Labor Statistics (BLS) to estimate the potential market from 2000 through 2008. The analysis is then focused by considering drivers that will affect the number of potential users who become actual users. That information will assist FEMA in developing the appropriate marketing mix to reach specific market segments across the universe of potential users. Finally, this section provides insights about the future market by framing them within the Four Ps of Marketing and using input from existing and potential users about their existing and future planning needs.

## Analysis of the Scope of the Potential HAZUS Market

This analysis identifies and characterizes potential future users of HAZUS. Tetra Tech patterned the analysis of the future HAZUS market after the approach outlined in Section 3 of this report. Information used to enumerate the potential users and describe the future markets was obtained through data sources from FEMA, the Census Bureau, and the BLS. Standard Industry Classification (SIC) and Standard Occupational Classification (SOC) information contained in the BLS's Occupational Employment Statistics (OES) reports were used to correlate and derive data for the market segments and user roles defined in this study. The correlation between market segments and SIC titles, and User Roles and SOC titles is shown in Table 4.1.

**Table 4-1  
CORRELATIONS BETWEEN MARKET SEGMENT, USER ROLE, AND STANDARD INDUSTRIAL AND OCCUPATIONAL TITLE**

Market Segment	SIC Title	User Role	SOC Title
Federal Executive Branch	Federal Executive Branch and United States Postal Service (OES designation)	Software Operator	Cost Estimators
State Government	State Government (OES designation)		Geographers
Local Government	Local Government (OES designation)		Geography Teachers, Postsecondary
Academia	Colleges, Universities, Professional Schools, and Junior Colleges		Geoscientists, Except Hydrologists and Geographers
Private Sector	Combination Electric and Gas, and Other Utility Services	Data Enhancer	Hydrologists
	Electric Services		Natural Sciences Managers
	Engineering, Architectural, and Surveying		Materials Engineers
	Fire, Marine, and Casualty Insurance	Engineer or Consultant	Materials Scientists
	Gas Production and Distribution		Surveying and Mapping Technicians
	Land Subdividers and Developers	Risk Manager	Civil Engineers
	Research, Development, and Testing Services		Environmental Engineers
	Sanitary Services		Emergency Management Specialists
Water Supply	Leader/Decision Maker/Flood Plain Manager or Building Code Official	Urban and Regional Planners	





OES data from BLS used in this analysis indicate numbers employed within the defined industries and occupations in the year 2000. To determine the potential number of HAZUS users in 2008, occupation-specific employment projections for each year from 2000 through 2008 were totaled based on growth factors provided by BLS. Table 4-2 presents the potential numbers of HAZUS users in 2000 and 2008 grouped by market segment, user role, and SOC title.

**Table 4-2  
ESTIMATED POTENTIAL HAZUS USERS MARKET (2000 TO 2008)**

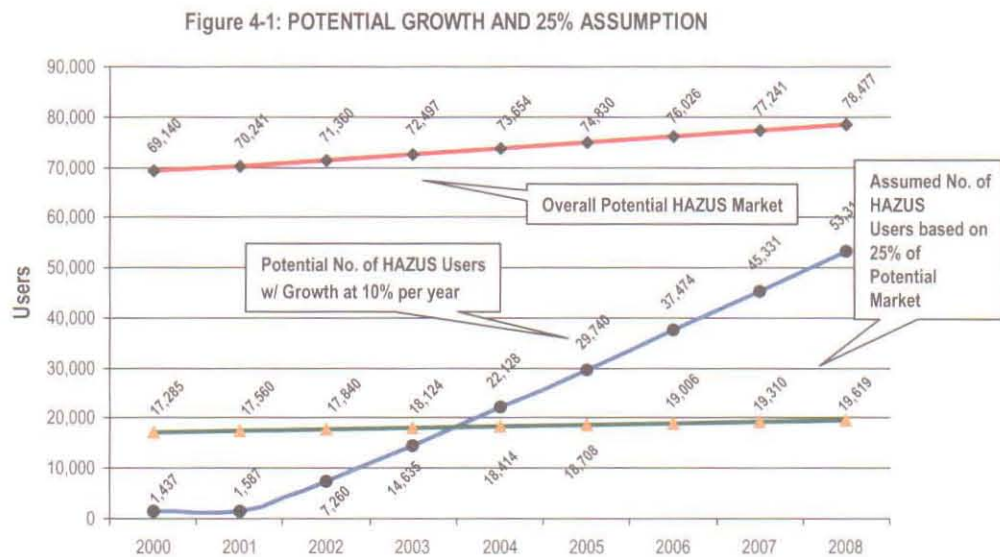
Market Segment	User Role	SOC Title	2000	2008
Federal Executive Branch	Data Enhancer	Cartographers and Photogrammetrists	930	1,034
		Surveying and Mapping Technicians	1,620	1,960
	Leader/Decision Maker/Flood Plain Manager or Building Code Official	Urban and Regional Planners	440	497
	Operator of Software	Geographers	430	497
		Geoscientists, except Hydrologists and Geographers	2,690	3,108
State Government	Leader/Decision Maker/Flood Plain Manager or Building Code Official	Urban and Regional Planners	3,440	3,887
	Operator of Software	Cost Estimators	160	181
		Geoscientists, except Hydrologists and Geographers	1,990	2,299
		Hydrologists	1,220	1,455
Risk Manager	Emergency Management Specialists	890	1,028	
Local Government	Leader/Decision Maker/Flood Plain Manager or Building Code Official	Urban and Regional Planners	20,210	22,838
	Operator of Software	Cost Estimators	340	384
		Geoscientists, except Hydrologists and Geographers	1,610	1,860
		Hydrologists	320	382
Risk Manager	Emergency Management Specialists	3,790	4,378	
Private Sector	Data Enhancer	Materials Engineers	1,490	1,611
		Materials Scientists	1,980	2,141
	Engineer or Consultant	Civil Engineers	4,330	4,681
		Environmental Engineers	570	688
	Leader/Decision Maker/Flood Plain Manager or Building Code Official	Urban and Regional Planners	2,790	3,153
	Operator of Software	Cost Estimators	5,430	6,131
		Geographers	30	35
Geoscientists, except Hydrologists and Geographers		4,900	5,661	
Risk Manager	Hydrologists	1,320	1,575	
Risk Manager	Emergency Management Specialists	870	1,005	
Academia	Operator of Software	Geography Teachers, Postsecondary	3,550	4,101
		Natural Sciences Managers	1,740	1,838
	Risk Manager	Emergency Management Specialists	60	69
<b>TOTAL</b>			<b>69,140</b>	<b>78,477</b>

The potential HAZUS MH users market depicted in Table 4-2 was derived from the BLS data by selecting industrial and occupational classifications that correspond with the User Roles defined in Section 3 of this report and profiled in the FEMA HAZUS Users Database. The average annual growth depicted in the potential market from year 2000 through 2008 is 1.6 percent. The



market segments and user role numbers for years 2000 and 2008 indicate the number of HAZUS MH users if one assumed that 100 percent of the identified potential users became a HAZUS MH user. To develop a plausible indication of the number of HAZUS MH users, the potential market is evaluated relative to observations of the known HAZUS user population and assumptions regarding additional drivers of demand.

The FEMA HAZUS Users Database contains records for 1,759 users that are assumed to be using HAZUS or at least aware of its capabilities and applications. The potential market data derived from the BLS describes users based on employment statistics for year 2000 when estimates of direct HAZUS usership indicate approximately 1,300 users. The approximately 1,300 users represent about 2 percent of the potential market in year 2000. While this number is a small fraction of the potential market, the increase to 1,759 users over a two-year period indicates a rapid expansion of HAZUS use and awareness. This increase of more than 25 percent suggests the potential for substantial growth of HAZUS MH usership within the available market. Figure 4-1 illustrates the resulting number of HAZUS MH users relative to the potential market assuming either a yearly growth rate comparable to recent increases in HAZUS usership, or a fixed 25 percent of the potential market.



Low and high estimates of potential HAZUS users were derived from the observed growth in HAZUS users, assumptions regarding the feasibility of significantly increasing market pull and push conditions, and the affect of various drivers. The low estimate is based on the assumption that under the current market pull conditions approximately 10 percent of the potential market would use HAZUS MH. The high estimate is based on the assumption that current market pull conditions and additional elements of market push will increase users at a growth rate comparable to recent HAZUS user increases at 10 percent of the potential market each year. Market push is those factors that FEMA could use to increase the current market demand (for example, devoting additional resources to targeted user group outreach, training and technical support, and assistance with DMA 2000 compliance). Current market pull conditions will likely be increased by the addition of the flood module and planned market push initiatives. Factors contributing to market push and pull and recommendations for their enhancement are discussed in Section 1 of this report. Consequently, the low estimate of 10 percent of the overall market would likely represent an under assessment of potential HAZUS users. On the high end of the





estimate, it is unrealistic to assume that the number of HAZUS users will increase by 10 percent of the potential market every year through 2008 once various market pull needs have been met. A more plausible estimate of the potential HAZUS users assumes a rapid increase of users followed by a leveling off at approximately 25 percent of the potential market. The resulting low (10 percent per year), medium, and high (25 percent) estimates are summarized in Tables 4-3 and 4-4. Table 4-3 is organized by market segment and user roles. Table 4-4 is summarized by FEMA region.

**Table 4-3  
POTENTIAL HAZUS USERS BY MARKET SEGMENT AND ROLE**

Market Segment	User Role	Year 2000				Year 2008		
		Potential Market	10%	25%	10% per year	Potential Market	10%	25%
Federal Executive Branch	Data Enhancer	2,550	255	638	281	2,994	299	749
	Leader/Decision Maker/Flood Plain Manager or Building Code Official	440	44	110	48	497	50	124
	Operator of Software	3,120	312	780	343	3,604	360	901
State Government	Leader/Decision Maker/Flood Plain Manager or Building Code Official	3,440	344	860	378	3,887	389	972
	Operator of Software	3,370	337	843	371	3,935	393	984
	Risk Manager	890	89	223	98	1,028	103	257
Local Government	Leader/Decision Maker/Flood Plain Manager or Building Code Official	20,210	2,021	5,053	2,223	22,838	2,284	5,710
	Operator of Software	2,270	227	568	250	2,626	263	656
	Risk Manager	3,790	379	948	417	4,378	438	1,095
Private Sector	Data Enhancer	3,470	347	868	382	3,752	375	938
	Engineer or Consultant	4,900	490	1,225	539	5,369	537	1,342
	Leader/Decision Maker/Flood Plain Manager or Building Code Official	2,790	279	698	307	3,153	315	788
	Operator of Software	11,680	1,168	2,920	1,285	13,401	1,340	3,350
	Risk Manager	870	87	218	96	1,005	101	251
Academia	Operator of Software	5,290	529	1,323	582	5,939	594	1,485
	Risk Manager	60	6	15	7	69	7	17
<b>Totals</b>		<b>69,140</b>	<b>6,914</b>	<b>17,285</b>	<b>7,605</b>	<b>78,477</b>	<b>7,848</b>	<b>19,619</b>

**Table 4-4  
POTENTIAL USERS BY FEMA REGIONS**

FEMA Region	Year 2000				Year 2008			
	Potential Market	10%	25%	10% per year	Potential Market	10%	25%	10% per year
Region 1	5,280	528	1,320	581	5,992	599	1,498	5,574
Region 2	4,887	489	1,222	538	5,548	555	1,387	5,159
Region 3	9,782	978	2,445	1,076	11,104	1,110	2,776	10,327
Region 4	7,933	793	1,983	873	9,004	900	2,251	8,375
Region 5	6,577	648	1,619	712	7,351	735	1,838	6,838
Region 6	5,848	585	1,462	643	6,640	664	1,660	6,175
Region 7	5,946	595	1,487	654	6,751	675	1,688	6,278
Region 8	5,011	501	1,253	551	5,681	568	1,420	5,290
Region 9	13,587	1,359	3,397	1,495	15,423	1,542	3,856	14,344
Region 10	4,390	439	1,098	483	4,983	498	1,246	4,634
<b>Total</b>	<b>69,140</b>	<b>6,914</b>	<b>17,285</b>	<b>7,605</b>	<b>78,477</b>	<b>7,848</b>	<b>19,619</b>	<b>72,994</b>



## ***Five Drivers for the HAZUS Market***

The scope of the potential market as estimated previously in the section, demonstrates that there are a large number of potential HAZUS users. Within that large group, outreach and training and technical support should target potential users most likely to have immediate or pressing needs. To evaluate those factors driving use of HAZUS, this section presents five areas that will serve as drivers for potential users in certain market segments and user groups. Reviewing those drivers also assists in considering approaches for outreach and training and technical support to gain from the effect of these drivers on HAZUS use. The drivers discussed below include: (1) the release of the multi-hazard HAZUS MH software, (2) the effect of DMA 2000, (3) the formation of local HAZUS user groups, (4) training and technical support efforts, and (5) the general increased awareness of the need to plan for disaster mitigation for both natural and man made disasters.

### ***Market Driver 1: Releasing HAZUS as a Multi-Hazard Tool***

The HAZUS MH software is expected to be released in 2003. The new version will include modules for flood and wind hazards in addition to the existing earthquake module. The additional modules will increase the potential user population for HAZUS MH to include the flood communities in riverine and coastal areas and representatives supporting wind-based hazard areas. The following focuses on the flood community as a potential HAZUS MH user group.

Flood management efforts have evolved since the passage of the federal flood insurance program enacted under the National Flood Insurance Act of 1968 and the substantial amendments of the National Flood Insurance Reform Act of 1994 (NFIRA). Approximately 20,000 communities are eligible for the National Flood Insurance Program (NFIP) and have adopted floodplain management regulations that meet or exceed FEMA standards. Although many of those communities do the minimum necessary to join the NFIP, increasing numbers have been going beyond the minimum standards and establishing more comprehensive floodplain management programs. Those communities with more developed programs are potential HAZUS MH users.

Presidential Executive Order 11988 on Floodplain Management requires federal agencies to conduct a decision-making process before undertaking actions or implementing programs in a flood plain. Other water related acts, such as Section 206 of the Flood Control Act of 1960, as amended, authorize federal government efforts to support flood management through direct technical support to states, counties, and cities in planning the prudent use of land subject to flooding from streams and lakes. Those agencies also may be potential HAZUS MH users because the software can assist their review of such actions or support or encourage recipients of their grant programs to use HAZUS MH.

Under NFIRA, FEMA's Flood Mitigation Assistance (FMA) program was developed to support funding for states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to structures insurable under the NFIP. The FMA provides grants to state and communities in three areas: planning, projects, and technical support. Because of potential economic savings, those efforts are, and will, remain important. According to FEMA, floods result in property damage ranging in excess of \$1 billion annually (under the NFIP) to \$5 to 6 billion annually (for uninsured and NFB). Approximately one-third of people living in heavy flood zones in the United States carry flood insurance. FMA-related grants strongly emphasize





the prevention of repeat occurrences of damage, in accordance with FEMA's Repetitive Loss Strategy. Funding for the FMA is approximately \$20 million annually.

In 1990, FEMA developed the Community Rating System (CRS) to support better planning for floods under the NFIP. CRS allows communities to receive reduced insurance premium rates, which reflect the reduced flood risk resulting from activities that (1) reduce flood losses, (2) facilitate accurate insurance rating, and (3) promote the awareness of flood insurance.

The number of communities participating in the NFIP program and the number of policies in these communities is shown in the Table 4-5. Those communities each represent locations where HAZUS might be applied to support flood mitigation planning. Larger NFIP communities may have the capabilities to run HAZUS locally, while smaller communities likely may need assistance from state or federal agencies using HAZUS to run scenarios for flood planning.

Flood representatives at the local level could include county, city, or township personnel. In addition, other potential users comprise the flood community. Those parties include: representatives of state flood programs, staff of federal agencies [for example, FEMA and the U.S. Army Corps of Engineers' Headquarters and Districts], consultants, and academia supporting flood management efforts. The Association of State Floodplain Managers (ASFPM) supports flood-related planning representatives and includes members from government agencies, non-government organizations, and private companies, including more than 500 Certified Floodplain Managers. Private entities that support flood-related activities include insurance companies, lenders, and consulting firms. In addition, coastal management agencies responsible for planning related to coastal areas have flood-related duties. Also, special districts identified for water-related and other efforts could include potential HAZUS users; for example: conservancy districts, watershed districts, regional planning commissions, and storm water management districts and commissions. Many of those districts have the authority to tax and may be better equipped and staffed to use HAZUS before other potential users.

**Table 4-5  
PARTICIPATION IN THE NATIONAL FLOOD INSURANCE PROGRAM**

<b>Number of Communities Participating in NFIP by Size of Community</b>							
Population of Community (top row), Number of Communities in Population Range (second row)							
0 to 999	1,000 to 1,999	2,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 to 49,999	50,000 to 100,000	More than 100,000
4,958	3,045	3,823	2,485	2,619	1,189	618	420
<b>Number of Communities Holding NFIP Insurance Policies</b>							
Number of Policies Held	0	1 to 10	11 to 50	51 to 100	101 to 500	More than 500	
Number of Communities with This Many Policies	3,422	7,318	4,811	1,464	1,804	887	

Source: FEMA NFIP Data, provided by Mike Robinson of FEMA



Several factors that should be considered for the technology transfer of HAZUS MH to the flood community described below are based on input received from knowledgeable representatives of FEMA flood-programs, input to the NIBS study, and research conducted specifically for this market study.

- **The flood management community is different from the earthquake hazard planning community.** For example, the flood community is bigger and older (developing over a 30 year period), with significant institutional knowledge regarding flood issues. The flood community has significant experience where representatives of the community have a strong empirical knowledge of their local areas, compared to earthquake and wind communities may start with less data. Therefore, to help ensure credibility with this user community, the HAZUS MH flood module must align with other models and provide results that do not contradict real-world experience.
- **Flood community representatives currently employ many varied tools in the evaluation, declaration, and relief of flood related disasters (some tools are discussed with item 5 below).** However, the opportunity to apply a common tool such as HAZUS MH likely would present advantages to this community, particularly if those users are confident that (1) the methodologies and assumptions used align with standard practices for flood estimation and (2) that HAZUS MH modeling results will be accepted by programs which require data and planning on floods (for example, the NFIP and community-based planning under the DMA 2000 requirements). The developers of HAZUS MH are working to build on existing methodologies and tools and should continue to do so.
- **Grants or technical support funds for flood mitigation planning or other planning efforts that also might address flood hazards are available through other FEMA programs such as:** the State Hazard Mitigation Program (for statewide hazardous mitigation program), the Earthquake Program, the Hurricane Programs, and the Community Assistance Program. Much of the funding likely will be routed through programs supporting the requirements under DMA 2000 requirements (see the discussion about implementing regulatory requirements for additional DMA information).
- **The NFIP includes approximately 20,000 communities that must meet certain standards to participate in the NFIP, but many of which do not have strong data.** NFIP communities participating in CRS and larger communities may be better equipped to apply sophisticated tools such as HAZUS MH, while smaller communities may require greater assistance. Currently, 923 communities participate in CRS and those usually are larger communities and planning departments, with more resources and more activities to do. Communities participating in the NFIP Cooperative Technical Agreement Program, which includes parties that have agreed to do mapping on behalf of FEMA, also may be good candidates based on their experiences with mapping tools and the high cross-over between this program and CRS communities.
- **Lenders are drivers in this community.** Most flood insurance policies are purchased because a lender requires flood insurance as a condition of obtaining a mortgage loan. Also, the insurance industry may be a potential user both in relation to the requirements under the NFIP and in conjunction with its own lines of insurance (commercial buildings, and autos, etc.)



- **As states play a major role in flood efforts, states are also good targets.** The ASFPM association holds regular meetings; their members include representatives of government, non-government and private entities; and maintains a large presence in the flood community. Therefore, ASFPM also may provide a sound avenue for communication. Using the NFIP and the ASFPM to distribute and communicate information on HAZUS MH may be a successful approach. Regardless, coordination with well-established players will be key.

### ***Market Driver 2: Implementing Regulatory Requirements for Mitigation Planning – the DMA 2000***

In October 2000, the DMA was passed to amend the Stafford Disaster Relief and Emergency Assistance Act of 1988 (the Stafford Act). DMA reinforces the importance of pre- and post-disaster planning and is intended to encourage preemptive actions that will reduce disaster losses. To that end, a crucial aspect of DMA requires that states have approved State Disaster Mitigation Plans as a requirement of participation in the Hazard Mitigation Grant Program (HMGP).

That requirement provides States an incentive to update or prepare existing disaster plans. In addition, the requirement encourages a greater focus on mitigation planning in the future. All 50 states must comply with the requirement each could use HAZUS MH to support the development or revision of plans. CRS (see flood discussion above) already have such plans but likely these will be revised over time. Also, 8 to 10 communities per state are upgrading their plans (comprising up to 500 additional parties that could use HAZUS MH).

In accordance with the DMA, FEMA issued the Hazard Mitigation Planning and HMGP rule in 2002. The rule (1) addresses state mitigation planning; (2) identifies new local mitigation planning requirements; and (3) authorizes HMGP funds for planning activities and increases the amount of HMGP funds available to states that develop a comprehensive, enhanced mitigation plan. The rule also requires that repairs or construction funded by a disaster loan or grant must be carried out in accordance with applicable standards. Through those standards, FEMA may require safe land use and construction practices as a condition for grantees to receive disaster assistance under the Stafford Act.

HAZUS MH is one tool that states can use to develop these plans, conduct updates in the future, or crosscheck or refine their plans. While several states already are familiar with HAZUS (primarily, earthquake-prone states), other states may be more likely to learn about and use HAZUS MH in the future to assess flood and wind risks in their plans. FEMA can capitalize on the timing of the release of HAZUS MH with new requirements to develop and update plans. FEMA is in the process of developing data templates describing how to collect, import, and use information in HAZUS MH for optimal results.

Because implementation of DMA will be ongoing and community plans still need to be prepared and updated over the long-term, HAZUS MH's expected release in February 2003 should provide a timely and useful tool that can support state- and local-level representatives with planning, technology transfer, training, and hazard communication.



### ***Market Driver 3: Forming HAZUS User Groups Increases Local Demand***

A HAZUS User Group is a cooperative partnering of public sector, private sector, and academia for the common goal of creating enhanced disaster-resistant communities and reducing the loss of lives and property resulting from a disaster. The concept of creating a HAZUS User Group began in 1997 when the HAZUS earthquake software was released and the San Francisco BAHUG was formed. Since then, approximately 20 HAZUS User Groups have been formed, or are currently forming throughout the country. These groups contain from 5 to 120 participants representing the organizations and sectors described in a variety of the market segments referenced throughout this study.

Users previously not familiar with HAZUS become more aware of the tool by joining the group. The current location and specific users in the HAZUS distribution database confirm this demand trend. Members of the HAZUS Users Group have professional affiliations and networks that can further increase the demand; for example, if a group member is part of an organization national in its scope, the software and its benefits may be shared across the company. Because the user groups can form around a single hazard or multiple hazards, a HAZUS User Group normally conducts both official and unofficial training applying HAZUS in a variety of modes. As a result of these factors, FEMA support for the formation of HAZUS User Groups at the local and regional levels creates demand for the HAZUS MH tool.

Market segment representatives will be directly engaged in the formation and encouragement of additional HAZUS User Groups. Specifically, FEMA regions will play an important role in encouraging the formation of HAZUS User Groups and augmenting local groups with FEMA expertise and extensive information resources. In addition, the use of HAZUS MH as a beneficial tool is further compounded when diverse organizations from the various sectors can combine resources and share the cost of mitigation and response activities.

### ***Market Driver 4: Providing FEMA Training and Technical Support Critical to HAZUS Users***

Training offers interested potential users the opportunity to become experienced users. Interests from across the potential user market segments will drive the curriculum and timing of HAZUS MH training opportunities. The HAZUS users community will expand considerably and their need for training when the HAZUS MH system is released. Specifically, floodplain managers in medium to large communities are expected to express a significant interest in using HAZUS – in part, to fulfill the requirements of the NFIP.

Also, technical support will be in greater demand after the flood and wind modules are added; in particular, technical questions from consultants are anticipated because they will be hired to perform the risk analysis work. In addition, it was suggested that the nature and quantity of technical assistance might evolve to meet the needs of a diverse and potentially new community of users.

### ***Market Driver 5: Evolving Political and Social Climate for Planning and Mitigating Disasters***

In light of the current political and social climate, risk-based tools such as HAZUS are being sought for mitigating potential natural, as well as man made, disasters. This awareness and



need can create an additional demand for HAZUS MH as a planning and potential mitigation response tool.

HAZUS has an open database architecture that allows other databases to run on its platform and produce disaster scenarios beyond natural hazards. Large market segments with needs beyond natural disaster planning and mitigation, represent potential users of HAZUS MH. For those potential market segments, the impetus to use HAZUS MH is the tool's applicability to the needs of users in those segments and its ability to work with other risk-based tools to present and communicate a range of scenarios to potentially impacted communities.

### ***Input Regarding the Four Ps of Marketing: Product, Price, Place and Promotion***

This portion of the market study was conducted to further characterize existing users and to reach out to potential future users. The approach consisted of initial contact through electronic mail and secondary contact through targeted telephone calls. In coordination with FEMA, customer input was obtained from persons in market segments described in previous sections of this report. Input was solicited from representatives of Federal FEMA; Federal non-FEMA agencies (such as DoD, USACE, State Government organizations; Local Government; Other Government/ International/Non-Profit; and Quasi-Government organizations; Private Firms; Academia; and Private Citizens.

### ***Findings of the Study Organized by the Four Ps of Marketing***

The responses provided by those representatives was compiled into summaries for each market segment and divided into data for existing and potential users. That data was then reviewed to develop the findings presented in this section. Tetra Tech's analysis determined that for each market segment, responses of potential and existing users did not provide unique information. Therefore, responses from existing and potential users were combined to present the findings for each market segment. General insights regarding the Four Ps of Marketing are provided in Table 4-6.





**Table 4-6  
INSIGHT REGARDING HAZUS – ORGANIZED BY FOUR PS OF MARKETING**

Four P Criteria	Insights Provided by Study
<b>Product (What)</b>	<p><b>Technical Strengths:</b></p> <ul style="list-style-type: none"> <li>▪ Respondents from both the study and to the data collection effort identify HAZUS as being user friendly, although this is primarily limited to existing users. Potential users or users with limited experiences (such as training only) found the software to be too complicated.</li> <li>▪ Users in most market segments identified positive technical features of HAZUS such as open architecture, ability to integrate databases, a management tool that supports their job, and use of GIS.</li> <li>• Some NIBS study respondents indicate HAZUS is being used for mitigation, even in the absence of tools for using HAZUS for mitigation (users in twelve states are involved in mitigation planning).</li> </ul> <p><b>Technical Opportunities for Improvement:</b></p> <ul style="list-style-type: none"> <li>• Factors that are important to using a tool to mitigate risks include: timeliness of product, ability to integrate with existing GIS software, ability to address a variety of risks, information on inputs and outputs, ease of use, available training, and economic data.</li> <li>• Existing and potential users report waiting for additional features (for example, the flood and wind modules). The flood module was cited most often in the surveys. Some potential users indicated that the data collection investment would be easier to justify if more modules were available for use.</li> <li>• Existing and potential users indicate that the product is complicated to learn and that additional training and GIS experience is required to use the product.</li> <li>▪ Potential and existing State and local users were very specific about the HAZUS features they want improved relative to the existing data and assumptions in the earthquake modules such as population estimates and population density.</li> <li>▪ Most existing and potential users recommend software improvements to make HAZUS easier to use (for example, ability to save formatting in the map layout screen, creating a more menu-driven atmosphere for the occasional user, and create shape files outputs for regularly sized units).</li> <li>▪ One user noted that it would be useful to make HAZUS available through a network.</li> <li>▪ Data collection indicated that FEMA should consider identifying for users which data fields represent the most important data to collect and input at the local level</li> <li>▪ Funding would be helpful to update hardware and software for Tribal lands and regional FEMA NFIP staff.</li> <li>• Data collection indicated that federal, non-FEMA respondents are concerned with the cost of obtaining software and state that one clear advantage of HAZUS is its low direct price (free).</li> </ul>





**Table 4-6 (Continued)**  
**INSIGHT REGARDING HAZUS – ORGANIZED BY FOUR PS OF MARKETING**

Four P Criteria	Insights Provided by Study
Product (What) continued	<p><b>Management Strengths:</b></p> <ul style="list-style-type: none"> <li>Some respondents of the NIBS study indicate HAZUS is considered reliable/useful enough for generating reports for other agencies, although from data collection effort for this study, only FEMA noted its ability to assist the communities with risk assessments. Other market segments did not comment on this item.</li> </ul>
	<p><b>Management Opportunities for Improvement:</b></p> <ul style="list-style-type: none"> <li>Institutional barriers such as data acquisition from other agencies and executive support were mentioned in the NIBS study. One FEMA respondent to data collection efforts for this study suggested that management directives would help drive FEMA and state and local potential users to implement HAZUS. Lack of executive support also was noted as a barrier to implementation.</li> </ul>
Price (How much)	<p><u>Developmental Costs</u></p> <ul style="list-style-type: none"> <li>None identified in NIBS study, although a FEMA representative to data collection efforts undertaken for this study suggested that a price sensitivity analysis or evaluation be conducted before developing additional software or refining data within the existing software.</li> </ul> <p><u>Direct Costs to User:</u></p> <ul style="list-style-type: none"> <li>None identified in NIBS study. A person contacted through data collection efforts for this study (U.S. Geological Survey [USGS]) noted that HAZUS is free and therefore, the price is attractive.</li> </ul> <p><u>Indirect Costs to User:</u></p> <ul style="list-style-type: none"> <li>The NIBS study indicated that lack of funding for implementation and that user's lack inadequate computer equipment and software are indirect costs. FEMA input for this study appeared to confirm this statement and added that a lack of funding for training exists.</li> <li>State and local input to data collection efforts for this study indicated that as more hazard modules become available, the indirect costs would be easier to justify, as the tool can be used in more ways.</li> </ul>
Place (Where)	<ul style="list-style-type: none"> <li>A higher rate of response to data collection efforts was obtained from FEMA Region 8, than from other FEMA Region.</li> <li>Respondents to the data collection effort were geographically dispersed, with a higher number of existing and potential users from earthquake prone areas.</li> <li>For the NIBS study, more than 50% of state and local respondents came from seven states: California, Oregon, New Jersey, Illinois, Colorado, Georgia, and Maryland. State providing input to the data collection efforts came from California, Florida, Maine, Minnesota, Missouri, South Carolina, and South Dakota – and one local respondent represented an Indian Tribe.</li> <li>California is identified in the FEMA HAZUS Users Database as the state with the most users. However, California did not provide more input than other states to data collection efforts undertaken for this study.</li> </ul>



**Table 4-6 (Continued)**  
**INSIGHT REGARDING HAZUS – ORGANIZED BY FOUR PS OF MARKETING**

Four P Criteria	Insights Provided by Study
Promotion (How)	<ul style="list-style-type: none"> <li>▪ In the NIBS study, some respondents noted that executive level managers were not sufficiently supporting the promotion and use of HAZUS. This statement also was noted through data collection efforts.</li> <li>▪ For the data collection effort, FEMA input focused on the value of HAZUS for the state mitigation programs. However, state and local existing and potential users did not appear to confirm that statement. State and local respondents appear to appreciate the potential value of the tool but noted that additional management support, information on the benefits of HAZUS, and training (through on-line case studies and local training) would be useful.</li> <li>▪ A respondent to the data collection effort from the non-FEMA other governmental agencies noted one means for promotion to other agencies might be through identifying the integrative capabilities of HAZUS with other data and tools.</li> <li>▪ The data collection effort input appeared to stress the importance of highlighting the values and benefits of HAZUS, especially noting case studies as a valuable tool.</li> </ul>

*Source: Input collected for market study in the FEMA existing and potential user categories*

